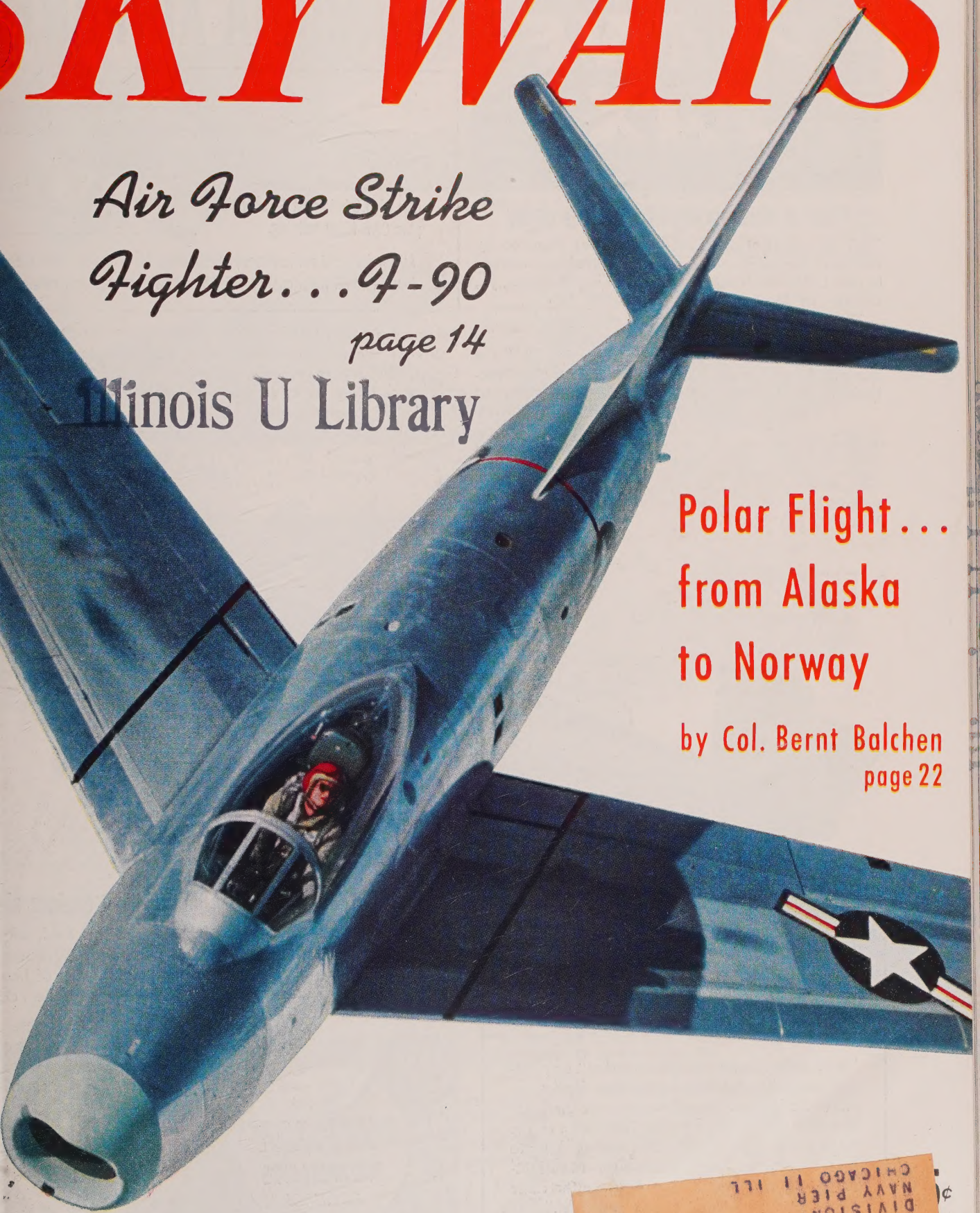
SKYWAYS



Air Force Strike Fighter . . . F-90

page 14

Illinois U Library

Polar Flight . . . from Alaska to Norway

by Col. Bernt Balchen

page 22

9K-485
CHICAGO UNDERGRADUATE
10-50
DIVISION
NAVY PIER
CHICAGO 11 ILL

Pilot's Report: New Beech B[illegible], page 18

PLANE FAX

Pilots at Monrovia Airport are saving money

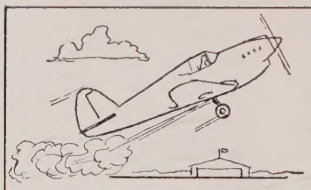
"All 70 planes at our field—everything from 65 hp Aeronca Champions to 450 BT-13's—have been switched to new CHEVRON 80/87," reports King Williams, Jr., manager of Monrovia's busy 27-year-old Airport.

"This new fuel costs less than 91/98 gasoline, but gives our planes continued high performance while it's saving us money. It's also reduced the leading-up of the spark plugs, as well as ending take-off knocking and pre-ignition. We like the way CHEVRON 80/87 helps us enjoy more powerful take-offs and extra power when it's needed."

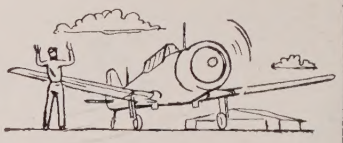
Private pilots throughout the West are now using powerful new CHEVRON 80/87 Aviation Gasoline—the fuel with a guaranteed anti-knock rating under all take-off conditions.

Quick picture of

MONROVIA AIRPORT Calif.

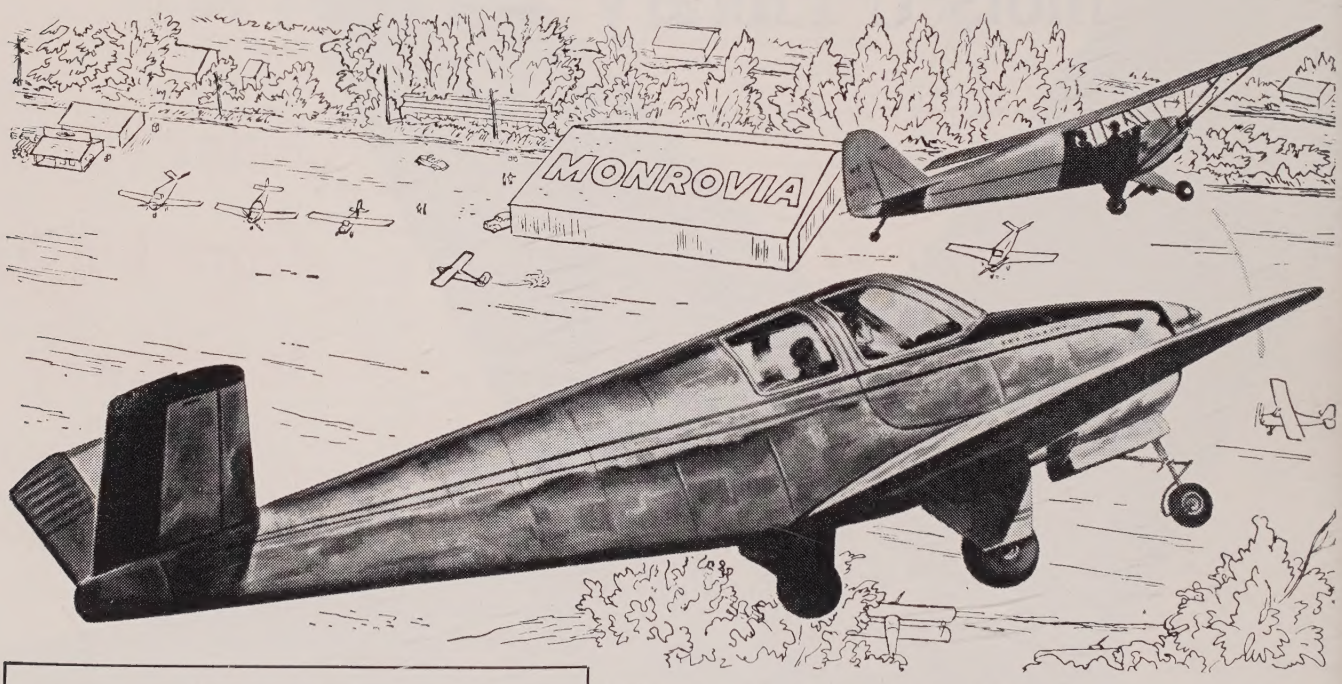


Site of early JATO experiments (jet-assisted take-off)—launched by Aerojet Engineering Corp.



One of U.S.'s largest GI schools... plus CAP flight training.

All services and conveniences—restaurant, facilities for major overhauls and all maintenance jobs, Standard products and services.



TIP OF THE MONTH

"A simple rule for staying on course."

"It's amazing how many pilots start out on cross-countries without following the basic fundamentals of navigation. That is: be sure your charts are complete and up-to-date, and always have all the maps you'll need. It's an embarrassing thing to be a member of the 'I-Didn't-Have-The-Right-Map' club. Don't let wrong maps be the cause of spoiling your next cross-country flight."

KING WILLIAMS, JR., Mgr. Monrovia Airport

Airport owner recommends "RPM" to keep engines cleaner

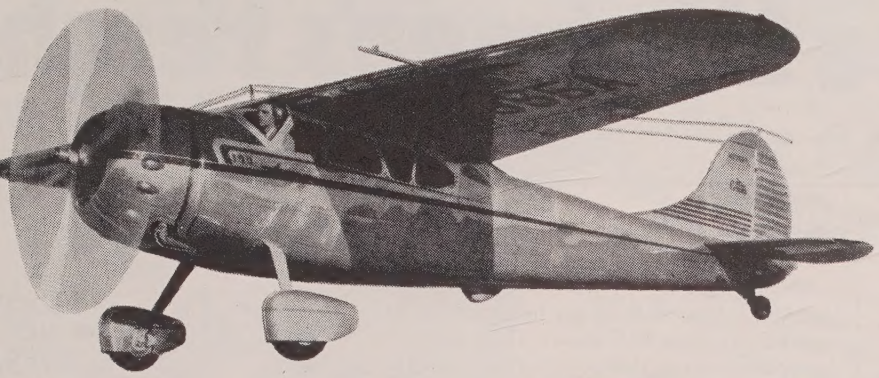
"Although we sell a number of lubricants at this field, we never hesitate to recommend RPM Aviation Oil," King Williams said. "I've inspected engines which have logged hundreds of hours on this fine aviation oil, and found that it definitely keeps them cleaner. Needless to say, 'RPM' customers are well satisfied."

CHEVRON AVIATION GASOLINE

RPM AVIATION OIL

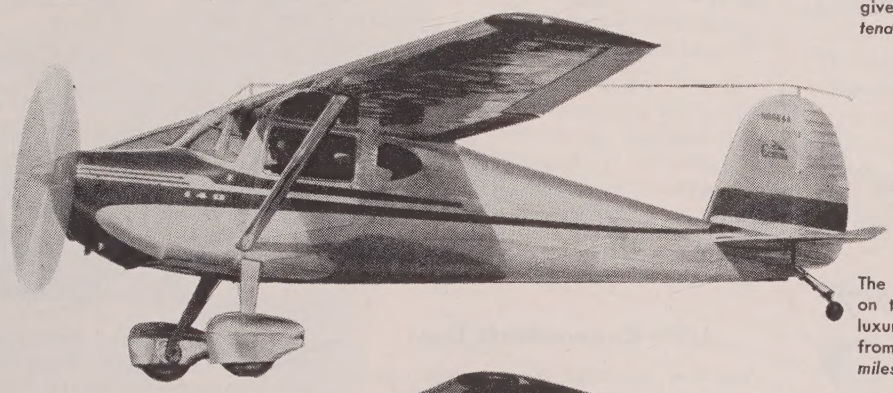
Standard Oil Company of California

DESIGNED TO PAY FOR THEMSELVES...AND MORE! ★



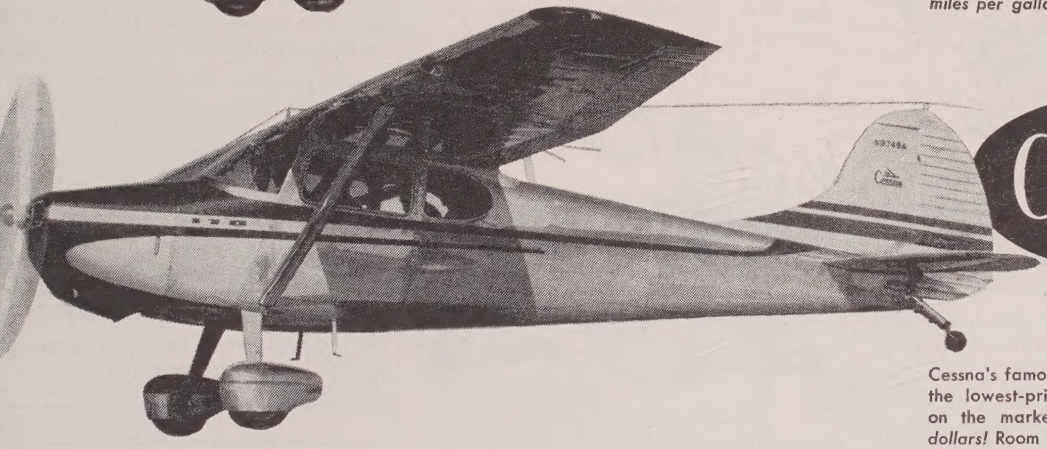
Cessna 190 and 195

The practical personal *airliner*. All-metal, 4-5 place. Airline-type engines. Your Cessna Dealer will be glad to show you that the 190 Series Cessnas give you shorter take-off, more speed, more range, more load and more comfort. By far the roomiest, most luxurious plane in its class—yet Cessna engineering gives you *extremely low operating and maintenance costs.*



Cessna 140

The *only* low-priced, all-metal 2-place plane on the market! It offers more room, more luxury features . . . and efficiency formulas from all over the U.S.A. *prove* it delivers *more miles per gallon, more speed, more range!*



Cessna 170

Cessna's famous "Family Car of the Air" . . . the lowest-priced, all-metal, 4-place plane on the market today *by several thousand dollars!* Room for 4 large men with luggage. Over 120 m.p.h. cruising speed. Over 15 miles per gallon of gas.

Pick Your Plane...From These All-Metal Cessnas

THERE'S ONE THAT FITS YOU...AND YOUR POCKETBOOK!

ke a good look at your business... *d yourself*. Then visit your Cessna aler.

e's prepared to show you—with facts d figures and by practical test—that ere's a Cessna which will more than y for itself in your business and add tra pleasure to your life.

r example, on an average 1,000-mile p in the U. S. A. the 2-place Cessna 0 will get you there within an hour DC-3 airline schedules. And with the ssna 170 and 190-195, you can *beat* C-3 airline schedules!

Yet all of these fast, luxurious Cessnas are also engineered for the simplest possible maintenance, the most economical operation plus great stability and ease of flying. You'll be amazed when you see the figures.

Think what this increased mobility—this ability to go where you want, when you want, quickly *and economically* can mean to you and your business! Think of the competitive advantages it will give you.

Only Cessna can produce such values because only Cessna builds a complete line of all-metal personal planes.

e Your Cessna Dealer Today...Arrange for a Practical Test

USE THIS COUPON

Cessna Aircraft Co.,
Dept. S-2, Wichita, Kansas

Please send free literature giving complete description of the Cessna 140 ( ); Cessna 170 ( ); Cessna 190, 195 ( ); Literature for model builders ( ).

Name.....

Street.....

City.....County.....

State.....Phone No.....

The Birdmen's Perch

"We're lost!" the Captain shouted.

Unless you're one of those eccentric buzz-boys who enjoy an emergency landing in somebody's pea patch, those words should scare the be-jeepers out of you.

It gets you right under the safety belt, as they say, and it ain't good. Yet, plenty of otherwise good flyers, who don't know their navigation from a hole in the ground, just plain go out and "get lost."

Take the average lightplane pilot who flies without radio help. He's a demon at following a four-lane highway on a clear day, but throw in some poor visibility and it's another story. And—even if he sports the latest in radio equipment, a fuse can blow his set deader than a herring.

There's only one answer—practice your navigation! Keep your technique "fresh" and there's no reason for you to ever get lost or miss your destination.

And Speaking of Destinations...

One of your regular destinations should always be the source of that scintillating super-lube, Gulfpride Aviation Oil—Series D!

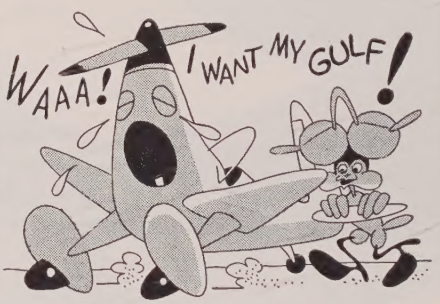
Modestly enough, it's the world's finest detergent dispersant oil for horizontally opposed engines because—it's the only lightplane oil put through Gulf's exclusive Alchlor process to remove extra carbon and sludge formers!

If your plane has the nasty habit of crying like a baby when you wheel it out of the hangar, all the little fellow needs is a shot of Gulfpride Aviation Oil—Series D—to free those sticky valves and rings.

And . . . you'll increase those periods between overhauls up to 100%!

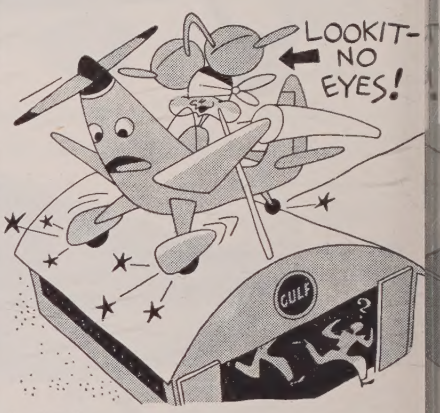
Little Known Facts Dept.

And now, students, if you can tear your eyes away from "Smiling Jack" for a



minute, the Dean has an important honor to confer. Will Mr. Leonard King of Adrian, Mich., step forward, please.

Mr. King, your Little Known Fact About Well Known Planes has been carefully scrutinized by the faculty and termed not only appropriate, but highly sensational. Therefore, with the powers invested in me by goodness knows who, I commission you as Perch Pilot (bottom rung)! If the student body will now rise, I shall read the Little Known Fact, submitted with PROOF!



"It was just twenty years ago that Jim Doolittle made the first instrument landing under the hood at Mitchel Field and proved that it was possible."

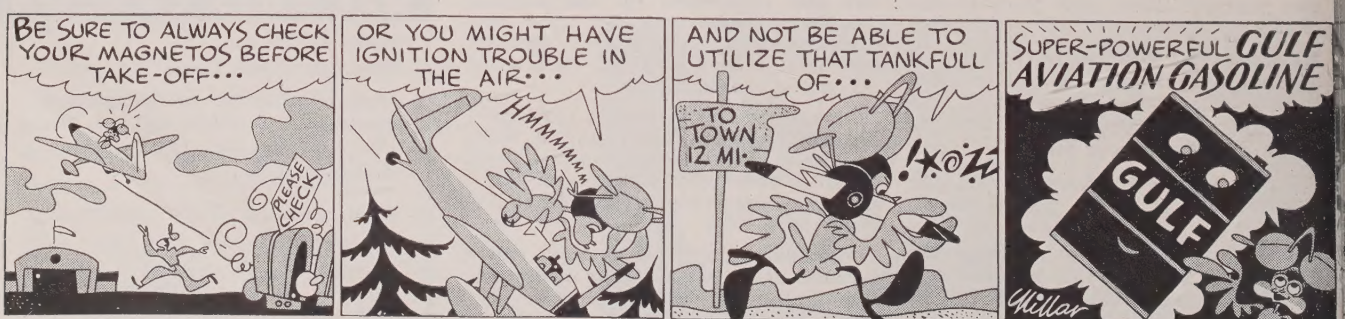
Ah pioneers, oh pioneers! Nice work, Leonard! Now suppose you tell the other boys and girls how proud you are of the new diploma and just how easy it was to dig up that L. K. F.

Don't remain unsung forever. Send your Little Known Fact About Well Known Planes—with PROOF—to this address:

GULF AVIATION DEPT., GULF BUILDING PITTSBURGH 30, PA.

Gulf Oil Corporation . . . Gulf Refining Company . . . marketers of

GULF AVIATION PRODUCTS


BE SURE TO ALWAYS CHECK YOUR MAGNETOS BEFORE TAKE-OFF...
PLEASE CHECK
OR YOU MIGHT HAVE IGNITION TROUBLE IN THE AIR...
HMMMMMM
AND NOT BE ABLE TO UTILIZE THAT TANKFULL OF...
TO TOWN 12 MI.
!*@%
SUPER-POWERFUL GULF AVIATION GASOLINE
GULF
Millar

Vol. 9, No. 5, May, 1950, SKYWAYS is published monthly by J. Fred Henry Publications, Inc., 444 Madison Ave., New York 22, N. Y. Printed in U. S. A. Single copy 25 cents. Subscription Prices: U. S., possessions, Canada and Pan.-Am. Union, $7.00 for three years, $5.00 for two years, $3.00 for one year; all other countries add $1.50 per year for postage. Six weeks required for address changes (give both old and new address). Manuscripts, drawings, other material must be accompanied by stamped, self-addressed envelope. SKYWAYS is not responsible for unsolicited material. Reentered as second-class matter April 16, 1948, at the post office at New York, N. Y., under the act of March 3, 1879.

Copyright 1950 by J. Fred Henry Publications, Inc.

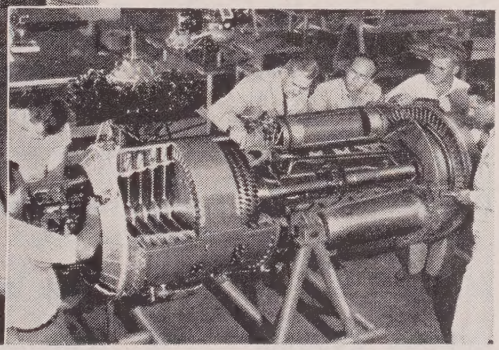
Make this YOUR DESIGN for SECURITY and SUCCESS

Fascinating work and rich rewards can be yours... from the very start... in Aeronautical Engineering—the key division of Aviation. Here is the career field that offers everything a man could ask for, if you have the foresight and ambition to grasp this opportunity.

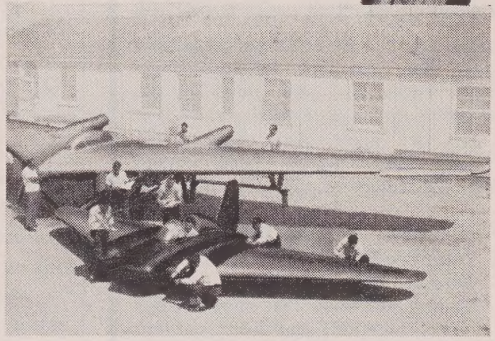
The past foretells the future. Last year aircraft production was SEVEN times greater than in 1939, only 10 years back.* In 1949 the passenger-miles flown by U.S. airlines was TWELVE times more than in 1939.* Aviation constantly outdoes itself—in new records, new achievements. Things to come in the next 10 years defy your imagination. In those 10 years YOU can grow with Aviation—in personal achievement, earnings, security...with a successful lifetime career stretching on ahead.

Of those 10 years you need only two years—not four—to complete your Northrop course in Aeronautical Engineering. You train in an outstanding technical school conducted by an aircraft company world-famous for history-making aviation achievements. Northrop training has won choice jobs for graduates with ALL leading aircraft manufacturers and airlines. Northrop-trained men are in demand. Classes start every 8 weeks—you can start YOUR training soon. For complete information and catalog send coupon now.

*Based on official Bureau of the Census and Civil Aeronautics Administration figures for 1939, and Air Transport Association and Aircraft Industries Association figures for 1949.



Up-to-the-minute training in Jet Power Plants is one of the many important practical advantages for Northrop students. This group is studying the construction and operation of the powerful General Electric TG-180 turbo-jet engine.



Northrop student engineers learn the principles of advanced all-wing aircraft design, as they study the design and aerodynamic characteristics of a Northrop-built experimental "buzz bomb" (front), and one of the N-9M 60-foot scale model Flying Wings (rear).

FOR THIS CATALOG—SEND COUPON NOW

Northrop Aeronautical Institute

1521 EAST BROADWAY, HAWTHORNE, LOS ANGELES COUNTY, CALIFORNIA

Division of Northrop Aircraft, Inc.
James L. McKinley, Managing Director

highest approvals

Veterans Administration—Engineers' Council for Professional Development—Civil Aeronautics Administration—National Council of Technical Schools—California State Board of Education—U. S. Dept. of Justice, Immigration and Naturalization Service

NORTHROP AERONAUTICAL INSTITUTE
1521 E. Broadway, Hawthorne, Los Angeles County, Calif.

Please send information on opportunities in Aeronautical Engineering, your catalog, and starting dates of classes. I am interested in:

☐ Aeronautical Engineering • Aircraft & Engine Mechanics ☐

NAME _____ AGE _____

ADDRESS _____

CITY _____ ZONE _____ STATE _____

Check one: ☐ VETERAN ☐ NON-VETERAN

Coming Up... in SKYWAYS

Spring is the time when that proverbial young man's fancy lightly turns to thoughts of love . . . . love of flying, that is (it says here!). The skies are filled with puddle-jumpers being affectionately nursed back into sky-cruising after a winter of rest . . . or mebbe rust. At any rate, if you're up and away on your first real summer-season X-C, take along your copy of SKYWAYS. A spring rain just might ground you someplace for an hour or so.

• Here's the line-up for June:

• "Pilot's Report: DeHavilland Beaver," *by Don Downie.* Here's an airplane that was designed for the pilots who fly the "bush country" of the North. Tough and rugged, like the type of terrain over which it flies and the weather it flies into and through, the *Beaver* is a Canadian airplane built for cargo and rough handling. If you've ever thought of giving in to adventure and flying those remote areas of Canada and Alaska, don't miss this pilot's report . . . . you may be flying a *Beaver* yourself some day.

• "Night Watch of the Air Force," *by Fred Bretcher.* The Northrop F-89 was designed for the USAF and built to fly and fight under all-weather conditions. In this article, the F-89's test pilot shows off the night-fighter qualities designed into this jet plane that could strike deadly blows at an enemy though he be hidden by the black of night.

• "Check . . . and Double-Check Your Pre-Flight," *by Gil Close.* If you have ever had to make a forced landing, you know that in most cases it was something you didn't see that resulted in your having to "set her down" in a hurry. Those "unseen" faults can cause a whale of a lot of trouble. Therefore, when you give your airplane that pre-flight, do more than just glance. Feel it . . . shake it . . . move it . . . do everything as well as look at it and . . . double-check that pre-flight. Gil Close, in this one, suggests a good Close look . . . and we recommend it, too.

These articles and many, many more are coming your way in the next issue. There's "Pilots—Polish Up Those Landings," "New Cessna 170," and many others in SKYWAYS

June Issue

On sale at all newsstands May 9

SKYWAYS

Cover: North American F-86

Strike Fighter: F-90 . . . . . Tony LeVier 14
Mailed fist of the Air Force is the mighty Lockheed F-90

Sky Cops . . . . . Steve Allen 16
Texas Rangers ride the Navion in battle against crime and criminals

Pilot's Report: New Beech Bonanza . . . . Don Downie 18
New 1950 Bonanza is tops in styling and plane performance

New Soviet Jet Fighter . . . . . William Green 21
Secret motion pictures prove Soviet gaining in jet fighter race

Alaska to Norway—Non-Stop . . Col. Bernt Balchen 22
The C-54 stakes another claim to fame on a polar hop to Norway

What's in a Trade? . . . . . Ed Hoadley 24
Beware of tricks in this matter of trading airplanes

Life Line to Everywhere . . . . . J. Fred Henry 26
MATS serves up good will as well as world-wide transportation

Flights of a Farmer 28
Much of the credit for success in this case belongs to one man's plane

Air Photos Pay Off . . . . . H. J. Burrows 30
There's money in air photos—and this pilot proves it

Thunder Over the Caribbean
Capt. Sidney Dean, Jr., USAFR 32
Portrex *demonstrates coordination of Air Force, Navy, Army and Marines*

Angle of Attack . . . . . V. A. Prevette 34
Angle-of-Attack meter could wipe out stall-spin mishaps

Dilbert . . . . . Robt. Osborn and Seth Warner 36
Knowing how to taxi safely is first step in good flying

Air Your Views 6
Military Aviation . . . 8
Hangar Flying 10
Prop Wash 12
Operational Eng. . . . 38
CAOA Report 40
CAP News 42

J. FRED HENRY . . . . . Editor and Publisher
D. N. AHNSTROM . . . Managing Editor STANLEY M. COOK . Production Manager
CHARLES W. ADAMS . . . . Art Director ARTHUR KAPLAN, Circulation Mgr. (Newsstand)
ANNE MASCHKE . . . Asst. Art Director A. E. CARDWELL . Circulation Mgr. (Subs.)
ALFRED B. BENNETT . Advertising Manager

MAY 1950 VOLUME 9, NUMBER 5

J. Fred Henry Publications, Inc. publishes SKYWAYS at 444 Madison Avenue, New York 22, New York. Advertising Offices: 444 Madison Avenue, New York 22, N. Y.; 6 N. Michigan Ave., Chicago 2, Ill.; 816 W. 5th Street, Los Angeles 13, Calif. Gordon Simpson, West Coast Manager. William H. Thomas, Chicago Manager.

The following publications are combined with SKYWAYS: Air News and Flying Sportsman. All rights to these names are reserved by J. Fred Henry Publications, Inc.

Bellanca NEWS REPORTER

"Builders of the world's most efficient airplanes since 1908" — New Castle, Del.

Excerpts from "SEALAND NEWS," Ansonia Airport, Shelton, Connecticut.

"Today we had the opportunity to fly the new Bellanca Cruisemaster."

"In the first place we found the speed claims erred on the conservative side—the thing actually outdoes its 180 mph advertised cruising speed. Boy, is it a lot of fun to pull up alongside a DC-3 airliner (there's a few left) *and then pull right out* ahead of him! It's all you can do to keep from thumbin' your nose at the guy a la the old automobile "Excuse My Dust" days! So much for the high speed—now for the other side of this "hot stuff" Bellanca. Naturally, you'd figure that this high speed with low horsepower comes from clipping off wing area and losing lift in the bargain resulting in a tricky job. Well it's tricky alright but the tricks were all performed in the designing room and the boys didn't even leave a single trick for the pilot to use in maneuvering or landing this fast little job."

"Take stalls for instance. We tried 'em both power-on and power-off from all kinds of crazy positions but couldn't entice the Cruisemaster into anytihng but a gentle settling—no sharp break off was encountered at all. Starting by simulating a pilot with very little experience attempting to do impossible things, we finally progressed to imitating a pilot who had gone plain crazy and yet we could not make that Bellanca develop any vicious attitudes. When it stalled, it did so gently and amazing as it may seem, there is just as much aileron control *during the stalls* as there was before. Landing this airplane in a three point attitude from a slow glide in gusty air (a dangerous procedure in most airplanes and one which we wouldn't recommend even in a Bellanca) you find a dropped wing can be instantly brought up by use of aileron alone in spite of low settling landing speed."

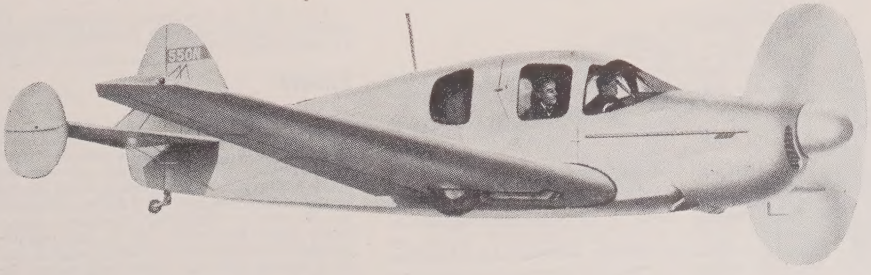
"And speaking of settling — when you put those flaps on full she comes down like a helicopter with very little forward speed and under full aileron control. If you suddenly "dump" the flaps, she quickly picks up forward speed with very little sink at all. If you have a stall or spin accident with a Bellanca Cruisemaster it will only be because you are determined to commit suicide—and even then you might get fooled because that cabin is so well protected that it would take a pretty bad smash to injure any occupants especially if they had safety belts and shoulder harness equipment. Another thing—when you suddenly apply flaps the nose tends to go down which is a safety feature."

"You might gather from this that we have gone overboard about this Bellanca. Well—you're right—we have! Here's a ship which is just as much at home on the small two-by-four grass field as it is at the large Municipal Airport. As Clarence says in his ad in "Contact" about another Bellanca—"It'll get in where it'll get out—and it'll get out where it'll get in." It has no special tricks and we firmly believe we could start a green student on this airplane and solo him safely as quick if not quicker than we can in the regular trainers in use today. It's an easy ship to fly, safe for the newcomer and faster than the oldtimer thinks possible until he tries it."

"Thanks for those kind words, Tom*. Now you know the difference between an airplane that is really designed and one that merely has a wing, a tail, a landing gear, a fuselage, an engine, and a propeller. Perhaps you were too fascinated by its amazing flight characteristics to notice the excellent job of sound-proofing, the new large door and windows, or the roomy cabin (4 inches wider and 6 inches longer), with comfortable foam rubber cushions, upholstered in genuine leather and nylon whipcord. Everything you saw was standard equipment, the controllable Hartzel, the two-way V-H-F (omni-extra), and all those instruments. Instead of selling for more, as it should, it sells for less. My job is to make them better and sell them cheaper."

(If any of you operators would like to see Tom's full report, write to me. If you would like to sell Bellancas, let me hear from you. We also have 8-10 and 20-25 seater feeder liners on wheels, floats, or amphibian gear.)

Clarence D. Chamberlin,
General Manager



Buy BELLANCA — it's the best buy — by far.

THE CRUISEMASTER $9,500.
F.A.F. New Castle

**Thomas R. Walsh, Editor of the "Sealand News," is a CAA Authorized Commercial Pilot Examiner.*

BELLANCA AIRCRAFT CORPORATION, NEW CASTLE, DELAWARE

Lear Service

Experts HANDLE YOUR INSTALLATION AND SERVICING OF

Lear { ORIENTER ADF / OMNIMATIC VHF / ENGINEERED SYSTEMS

LESS COST TO YOU

. . . because Lear Hangar Service has all factory facilities to quickly install, test, realign, adjust or repair Lear Radio Equipment and engineered systems for any aircraft.

EXPERT INSTALLATION

. . . because your service is performed by Lear Engineers and Lear factory trained technicians — Top Specialists in ADF-VHF Radio and other aircraft flight systems.

PERFECT OPERATION

. . . because your aircraft is flight tested by Lear CAA licensed pilots for guaranteed satisfaction.

DESIGNED BY LEAR
PRODUCED BY LEAR
INSTALLED BY LEAR
YOUR GUARANTEE OF FLIGHT SAFETY

LEAR, INCORPORATED
110 IONIA AVE., N.W.,
GRAND RAPIDS 2, MICHIGAN

AIR YOUR VIEWS

Airport Extras

Gentlemen:

We have read with a great deal of interest, the article "Airport Extra" by Harold Helfer in the February issue. He has brought out very well the advantages of farming airport patterns.

The top picture used on page 37 is the north half of the University Airport, now operated by the University of California College of Agriculture. Needless to say, we are continuing and expanding our pattern farming. This year we are planting oats, but we have plans for an irrigated crop next year so that we will have a green field all year long.

Farming and aviation are closely tied together, and we feel that full use of our pattern areas helps out not only the appearance of the airport but also the budget.

J. C. PATTERSON
Mgr. Univ. Airport
Davis, Calif.

Gentlemen:

The article entitled "Airport Extra" reads, "Some airports—like the one at Lawrence, Kansas—have become an agriculture enterprise first. At Lawrence, the field is completely given over to cloves, etc." We who own airplanes at Lawrence and who fly from the airport wish to take exception to the above statement. The Lawrence airport is primarily an airport! It is dedicated to first-class service for lightplanes, and it specializes in crop seeding, dusting and spraying. Our airport has three main runways ranging from 2600 to 3200 feet in length and all three are of a smooth cinder base. There is available full-time licensed mechanics, Magnaflux inspection for engine parts, a designated Aircraft Maintenance Inspector, and the airport is on day and night operations.

WM. CARLOS
JIM KANZIG
L. E. SURBER
R. H. BARTLEY
E. KANZIG
DALE STATES
Municipal Airport
Lawrence, Kansas

We share your enthusiasm for "airport extras", Mr. Patterson, as a means of additional revenue for field operations. Our regrets to Lawrence, Kansas, for apparently calling a wrong shot on them. But . . . . your field is sort of agriculture-minded, isn't it, what with dusting, seeding, etc? We think the clover idea is wonderful.—ED.

QB Query

Gentlemen:

Is there still an active organization called the Quiet Birdmen? If so, what are the requirements for membership?

BILL BROWN
Riviera, Calif.

The QB's very definitely are still an active organization . . . and we use the word "quiet" with tongue in cheek. Requirements are that you be voted into the outfit. It is a so-called secret organization and becoming a member hinges on your acceptance by all the QB's in the group, assuming you've been able to wangle an introduction to the members by a fellow QB.—ED.

Howard

Gentlemen:

Can you please furnish me with some information concerning an airplane called the "Howard?"

W. S. COMPTON
Augusta, Georgia

The first Howard was built in the 1930's by Howard Aircraft Corporation, St. Charles, Illinois. That company, once headed by famed flyer and plane designer Benny Howard (now with Fairchild), is no longer in existence, but some of the excellent planes it built are still flying. The last model was a five-place cabin high-wing monoplane powered by 450-hp Pratt & Whitney Wasp *engine. It had cruising speed of 190 mph and a range of 975 miles. Designated Model DGA-15P, it was built in 1941. By the way, when Benny Howard went to Washington to have the first Howard-designed and built airplane certificated, an official asked him what the model designation of his ship was. Mr. Howard replied that he hadn't given the plane any model letter or number designation. When he found out that he would have to if he wanted the ship certificated, Mr Howard quickly replied, "Okay, make it DGA . . . Howard DGA!" When the official asked Benny what the letters stood for, he replied, "Damn good airplane!" And the Howard Aircraft Corporation's airplanes from that time on carried the DGA designation.*—ED.

Pilot Fan

Gentlemen:

Last fall we had an "Open House" at Oakland Municipal Airport, and the day was a huge success, thanks to the show put on by the National Guard, Navy and civilian flyers. Highlight of the day was an amazing demonstration by Capt. Robert Love in an F-80. I've watched with interest write-ups on a lot of pilots, but I've never seen a story about this guy.

Sometime after the Oakland show, San Francisco sponsored a similar shindig, and people drove as much as 300 miles to see Capt. Love perform.

I'd like to see some information on this jet pilot. Boy, he's tops!

P. FLAHIVE
Oakland, California

We'll try to comply, Mr. Flahive, and come through with a feature on him in some later issue.—ED.

Pedalcopter

Gentlemen:

Can you give me the address of the man that invented the "Pedalcopter?"

G. HAMPTON
New York, N. Y.

According to available information, the Pedalcopter's papa's address is 20990 Harper, Detroit 24, Michigan.—ED.

Dilbert

Gentlemen:

There is enough of the Dilbert in most of us to make some of the column devoted to him autobiographical. Still, you can't always win!

On a short X-C in my little 40-hp *Cub* I got into trouble that even a good A&E couldn't help me out of. It was a beautiful summer's day, but hot. Down near Hartwick, N. Y., my engine stopped. It had never happened before and I was amazed. As I dipped my nose down and looked for a valley meadow (I was then over woods), the engine picked up again. It ran intermittently from there on into an airport, and since I had sufficient altitude for a safe let-down, I rode her on in.

I was there for three days while a mechanic tried to locate the difficulty. He replaced the coil and points in the mag, and test-hopped the plane for a few minutes on the third day. It seemed okay, so I got in and started for home. In about 20

minutes, the engine became rough, started to cough and quit. I picked the only available field, which was fully equipped with crossing powerlines, woodchuck holes, mowing machine and rake, and slipped in to a stop on the top of a knoll. A few minutes later, a curious farmer and his family came by to see what was wrong. They were more interested in my plane than in me, but finally they agreed to drive to a phone so that I could call the A&E again.

When he got to the farmer's field, he found me sitting on a tire, busy working out my philosophy on flying amid the aroma of a dead animal of some kind just windward of the plane. He pulled the prop and the engine started immediately and ran swell. Finally he decided I must have picked up some carburetor ice.

Well, I kicked myself for not testing that the first time the engine kicked up, climbed back into the airplane and took off for home again. The mechanic stood in the biggest of the woodchuck holes, and I got off by a half circle around him and a small hill.

Then it happened again! Fifteen minutes later the engine coughed and died. This time I had a 40-acre lot under me and I checked everything carefully before going in.

Then, instead of phoning an A&E, I called my wife. She came out with the car and drove me home. That night my partner and I drove back out to the plane to look over the situation. Of course, the engine worked beautifully again. So, in the cool of the evening, at reduced rpm, I flew it home. The next day I took the *Cub* up again and put her in a steep climb (I use that word in a relative sense in speaking of climb in a 40-hp *Cub!*). I heated the engine up good. She ran fine. In desperation I finally horsed back on the stick at about 3,000 feet . . . and she began to cough and sputter.

I suppose by now you've figured out, as I did then, that the trouble was in an over-heated mag. At an indicated oil temperature of 160-170° she would begin to give out.

Of course, we got a new mag and everything's been all right ever since. But I think you'll have to admit that that was a hard one to figure out. I'd have hated to have had to figure it out in anything but a *Cub*, especially with only one mag under the desk.

That old 40-hp J-3 wasn't a bad short-field plane at that.

E. KENDALL SCOUTEN

Beaver Falls, N. Y.

Thanks, EKS, for the recount of your experience. Like the A&E, we thought you were a victim of carburetor icing . . . so we'll file your "symptoms" away in our mental locker just in case.—ED.

Jet Info

Gentlemen:

I would like to know what happened to the Swift Aircraft Company. I've seen one or two of their ships, but I've never heard much about them or seen any advertisement any place.

Also, could you tell me the difference between these jets: axial flow, turbine, and propjet?

K. KISTLER

Anderson, Indiana

In reorganization of the company some time ago, Swift Aircraft Company became Texas Engineering and Mfg. Co., Inc., perhaps better known as TEMCO. The company is located at Dallas, Texas. Guess the company is hiding its light under a bushel. As to the jet differences . . . we'll try. A gas turbine is a powerplant which utilizes a turbine to take energy from a stream of hot gases for doing work external from the machine itself. The gas turbine is the principal of the jet engine itself. Axial flow is the design of the jet unit, i.e., the gases flow parallel to an axis. The turbo-prop is a turbojet engine in which the turbine is geared to drive a propeller. When a portion of the hot gases is ejected through a nozzle, the unit is sometimes referred to as a propjet.—ED.

Plane Dope

Gentlemen:

Can you give me any information on the Culver Cadet, Waco Model N, and Goodyear GA-2 *Duck*? What is the *Duck* selling for?

F. ELLIOTT

Bridgeport, Conn.

The Culver Cadet *was a popular prewar two-placer. One model was introduced after the war (World War II), but before it could be put into production, the company went out of existence. The 1941* Cadet *was powered by 75-hp Continental or 80-hp Franklin; had a cruising speed of about 115 mph and a range of 400 miles. It was a cabin monoplane (low-wing) with retractable gear. The Waco N was a five-place closed biplane that employed a tricycle landing gear. It was powered by 200-hp Jacobs engine, had a cruising speed of about 140 mph and a range of some 450 miles. It was popular in 1939. The Goodyear* Duck *is an "experimental" airplane that is not in production and is not on the market. Several are being used by operators in various parts of the country on strictly a test basis.*—ED.

Enjoy the World's Finest

TECHNICAL TRAINING IN AVIATION

and Earn While You Prepare for a Career in the U. S. Air Force

ILLUSTRATION F-80 SHOOTING STAR

Scientific aptitude tests help direct you to use your talents most effectively. Earn good pay right on the job as you learn under skilled experts. If you can qualify you may go to an Air Force technical school for training in one of the many great career fields. Enjoy new opportunities for education, experience, advancement. Ask about the new Airman Career Program today.

Choose Your Opportunities from many AIRMEN CAREER FIELDS

RADIO AND RADAR MAINTENANCE
AIRCRAFT AND ENGINE MAINTENANCE
AIRCRAFT ACCESSORIES MAINTENANCE
WEATHER
ARMAMENT SYSTEMS
FOOD SERVICE
TRAINING DEVICES MAINTENANCE
PHOTOGRAPHIC
AIR TRAFFIC CONTROL AND WARNING
WIRE MAINTENANCE
MISSILE GUIDANCE SYSTEMS
COMMUNICATIONS OPERATIONS
PHOTOMAPPING
INTRICATE EQUIPMENT MAINTENANCE
INTELLIGENCE ROCKET PROPULSION
MUNITIONS AND WEAPONS SUPPLY
VEHICLE MAINTENANCE PRINTING
METAL WORKING TRANSPORTATION
FABRIC LEATHER AND RUBBER
PROCUREMENT ADMINISTRATIVE
PERSONNEL EDUCATION MEDICAL
ENTERTAINMENT
MANAGEMENT METHODS
BUDGETARY ACCOUNTING AND DISBURSING
STATISTICAL AND MACHINE ACCOUNTING
GROUND SAFETY MARINE
FIREFIGHTING
SECURITY AND LAW ENFORCEMENT

VISIT YOUR NEAREST AIR FORCE BASE OR U. S. ARMY AND U. S. AIR FORCE RECRUITING STATION

RECRUITING U.S. ARMY U.S. AIR FORCE

U. S. AIR FORCE

MILITARY AVIATION

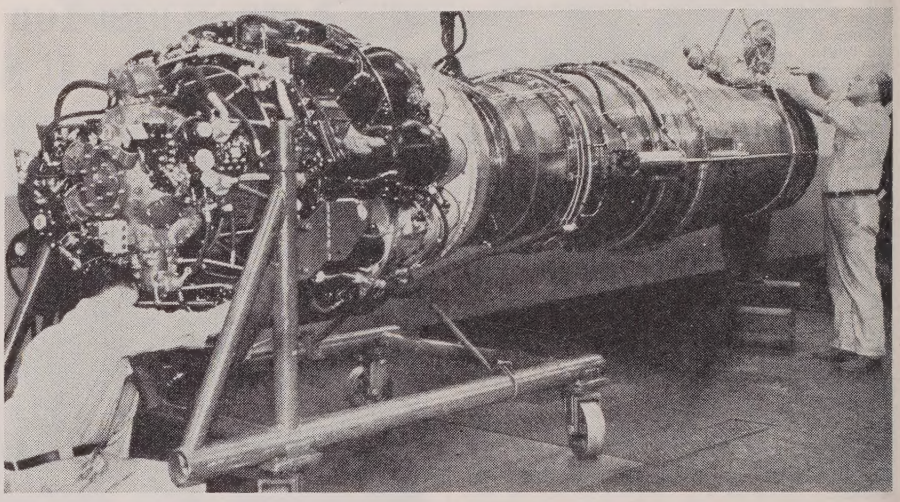
AERIAL GUNNERY practice with flying targets moving at speeds over 400 mph and at an altitude of almost 40,000 feet is the order of the day for jet fighters now that 14 B-45 four-jet *Tornado* bombers have been modified to tow a new type target. The new target pulled by the B-45 is a 20-foot cigar-shaped metal glider with 20-foot wingspan, and is built by Chance Vought Aircraft.

U.S. NAVY has taken delivery of the first of a series of sub-killer planes. The aerial sub chasers are specially equipped P2V *Neptunes* designed to seek out the formerly radar-proof "snorkel" submarines. This new version of the Lockheed P2V is designated P2V-4 and combines long range with navigation, communication and all-weather gear which permits it to operate under all conditions in any part of the world.

MARINE AIR RESERVE TROPHY was awarded the Marine Air Reserve Fighter Squadron 142, Miami, in ceremonies at the Naval Air Station at Miami, Florida recently. This trophy was won by the Miamians as the best Marine Air Reserve fighter squadron in the nation on the basis of all-round performance in 1949. Each year 30 Marine Reserve fighter squadrons compete for this trophy. General Clifton B. Yates, USMC, presented the trophy to Lt. Col. R. F. Smith, USMCR, commanding officer of the Miami squadron.

WALKING PX is a new sustenance kit developed by the Air Materiel Command's Aero Medical Laboratory for airmen operating in the Arctic regions. The kit is attached to the pilot's back-style parachute. A total of 22 different items are packed into the kit, most important of which is the newly developed sleeping bag which will keep its occupant warm even when the temp is 40° below. Also included in the kit are revolver, mittens, ski goggles, signaling mirror and flares, waterproof matches, wool socks, compass, water container, pocket knife, survival manual and food packets. The kit is a zipper container, and it weighs 24 pounds, fully loaded with 10 days of food rations, etc. It is now undergoing field tests in Alaska.

NEW AIRCRAFT fire detector has been undergoing exhaustive tests by the U. S. Navy Bureau of Aeronautics. This new type of fire detector may solve many of the problems concerned with the fire safety of aircraft. Developed by Petcar Research Corporation, the unit is now in the hands of Walter Kidde & Company where it is undergoing even further tests and study.



PRATT & WHITNEY J-48 *Turbo-Wasp* with afterburner is said to be most powerful jet engine now flying in the U.S. It powers the new F-93A and the F9F; has 6,250 pounds thrust

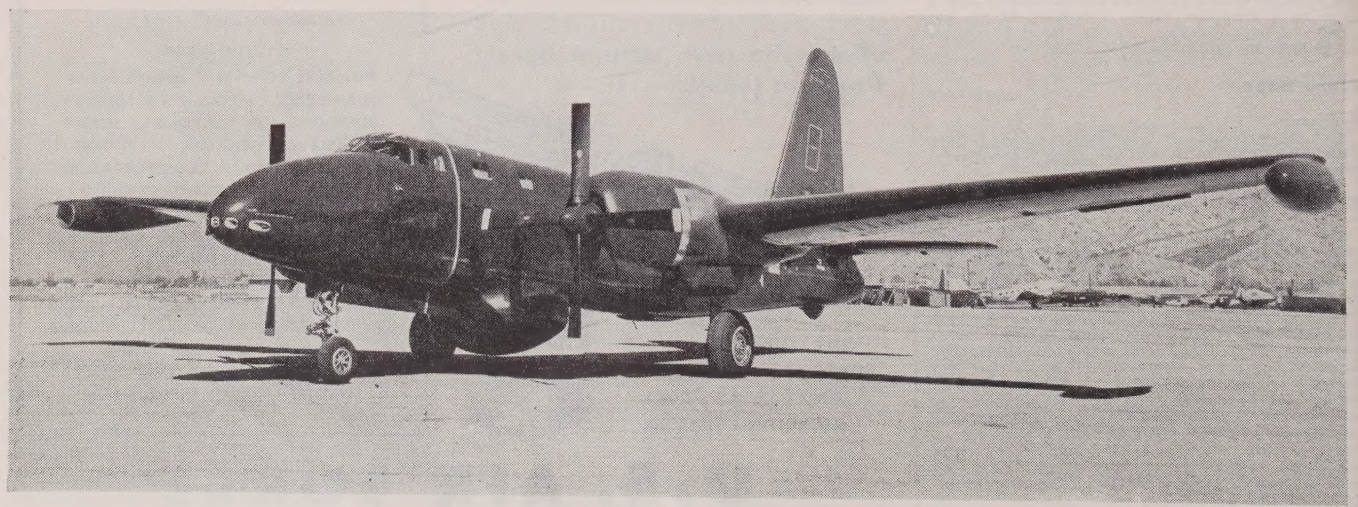
ELECTRONIC ENGINE ANALYZERS are expected to boost the cruise-controlled range of the B-36 and B-50 long-range bombers. The electronic engine analyzer will monitor the bombers' 28-cylinder engines during flight. Forty-five of these analyzers have been ordered by the USAF from Sperry Gyroscope Company.

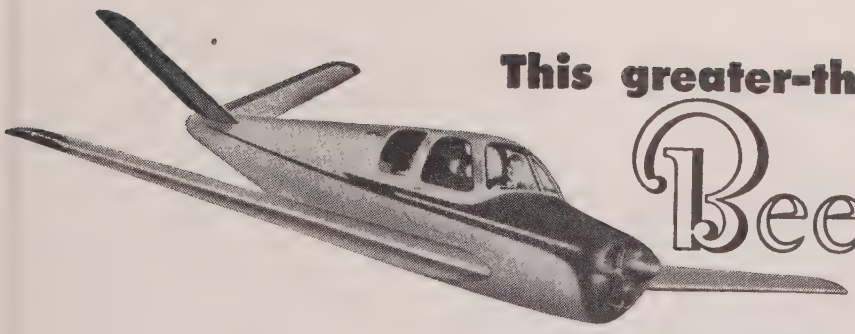
PRATT & WHITNEY'S new J-48 *Turbo-Wasp* is called "most powerful jet engine now flying in the U. S." With a basic dry rating of 6,250 pounds static thrust at sea level, the new jet powers the Grumman F9F *Panther* and North American F-93A. At the high operating speeds of these fighters, the J-48 provides each plane with equivalent of 11,000 hp. At 670 mph one pound of static thrust equals about two horsepower from conventional piston engine. British version of this jet engine is called the *Tay;* is built by Rolls Royce.

PIASECKI has been awarded an Air Force contract for development of an Arctic rescue helicopter. Designated the H-21, this new Piasecki 'copter is an advanced version of the HRP-2 all-metal transport helicopter now in Navy service.

BEHIND THE FRONT: Reports from the West Coast indicate the last batch of F-80's is coming off the line at Lockheed. This ship will be replaced on the line by the Lockheed F-94A and F-94B. The -94A is powered by the Allison J-33 (4600 pounds thrust); the B has the J-48 from Pratt and Whitney (6,250 pounds thrust). . . . . The new Boeing XB-52 is rumored to have eight jet units mounted in pods beneath the swept-back wings, as per the Boeing B-47. . . . . Bell Aircraft is said to be building four X-1A rocket research ships, improved versions of the Bell X-1 and with speeds in excess of 1600 mph. . . . . The Marines have taken delivery of Fairchild *Packets*. These will be used by Marine transport squadron VMR-252, commanded by Co. H. C. Lane.

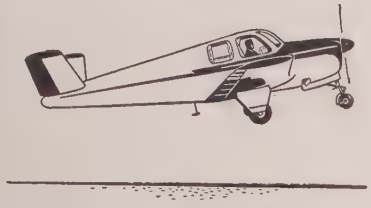
LOCKHEED P2V-4 might be called the "Snorkel Snipper." It is the Navy's new anti-submarine airplane. Radome under fuselage contains electronic search equipment. The *Neptune's* armament includes torpedoes, rockets, bombs, rapid-firing cannon, machine guns, etc.





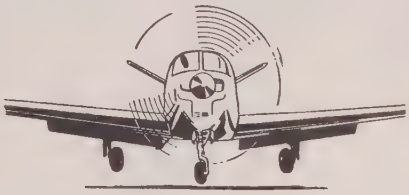
This greater-than-ever Beechcraft

is a better-than-ever value!



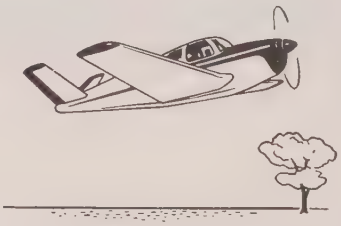
Increased Horsepower Rating at Take-off

Take-off horsepower rating is now 196 hp at 2450 rpm, providing improved take-off performance without sacrifice of long engine life, low operating and maintenance costs.



Increased, Faster Flap Travel, New Beechcraft Propeller

Improved short field take-off and landing performance is made possible by greater degree of flap travel and the greater static thrust of the new Beechcraft propeller.

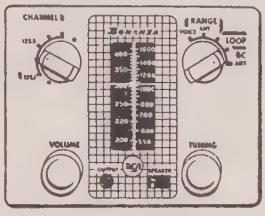


Faster Landing Gear Action — Both Up and Down!

The already quick action of the Bonanza's retractable tricycle landing gear has been speeded up even more. At 105 mph the gear lowers in 7½ seconds, goes up in 8½ seconds!

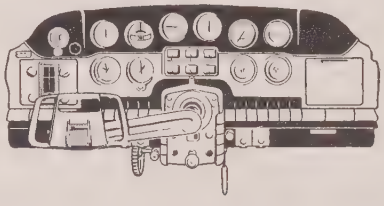
New Upholstery Combinations and Interior Designs

New combinations of blue, green and brown materials of warmth and beauty especially chosen to blend with the new range of exterior colors. Smart leather seat caps, new arm rests for all passengers.



New Radio Includes VHF Marker Beacon

The selection of the RCA 116 transceiver as standard equipment provides regular low-frequency operation for navigating four-course radio range, homing on range and standard broadcast stations; adds VHF channels.



New Instrument Panel Design, Safety-Type Wheel

New instrument panel design retains famous Bonanza operating convenience and efficiency, adds smarter-than-ever note to cabin appearance. And there's a new safety-type control wheel to match!

It has no equal in performance, speed, economy, strength, safety, style and comfort!

The new B35 Beechcraft Bonanza exceeds all promises for a speed-with-economy plane that's roomy, comfortable and easy to fly! New performance features at moderate horsepower add to its versatility and safety, hold operating and maintenance costs at a *business economy* level! New operating conveniences and luxury appointments plus scores of refinements call for a personal inspection because there's room here to show only a few. See it! Get all the facts! You'll agree this greater-than-ever Beechcraft Bonanza is a better-than-ever value!

Top speed, 184 mph
Cruising speed, 170 mph
Range, 750 miles
Fuel economy, 9.5 gph

Get all the facts! There are hundreds more — about the extra advantages of the new Model B35 Beechcraft Bonanza. Check with your nearest Beechcraft distributor or dealer, or write for complete information on your company letterhead to Beech Aircraft Corporation, Wichita, Kansas, U.S.A.

Beechcraft
BONANZA

BEECHCRAFTS ARE THE AIR FLEET OF AMERICAN BUSINESS

HANGAR FLYING

AERONCA MODEL 7EC is the new one in the 1950 stable at Middletown, Ohio. Powered by 90-hp Continental, the new *Champion* has a cruising speed of 100 mph at 75 per cent power

New Aeronca

The new *Champion* for 1950 is being introduced to flight school operators, flying farmers, ranchers, etc. Designated Model 7EC, the 1950 *Champion* is powered by 90-hp Continental which gives it a cruising speed (at 75 per cent of power) of 100 mph. Among the Standard Equipment features of the new *Champion* are flush locking door handles, locking left sliding windows, right-wing auxiliary fuel tank, Safe Flight indicator, 12-volt electrical system, starter, etc. Optional equipment includes full-cabin soundproofing, wheel fenders, metal prop, Bendix radio receiver, navigation lights, etc.

Attention, Pilots!

In a notice to airmen, the Administrator of the CAA advises that effective immediately, pilots entering the area between Norfolk, Va., and Limestone, Maine, from seaward, or making local or coastwise flights in this area more than 20 miles from the shoreline, are urged to file flight plans, preferably on the Instrument Flight Rules type. Also, pilots planning flights within 150 nautical miles (equivalent to 172 statute miles) of Los Alamos, New Mexico, at altitudes of more than 10,000 feet above mean sea level, or more than 4,000 feet above the immediate terrain, whichever is higher, should notify the CAA.

Failure to file such flight plans, the Administrator points out, might result in the dispatch of fighter aircraft to make identification.

The filing of these requested flight plans is necessary so that identification information may be transmitted to the Air Force. It is all part of a large-scale air-defense system in operation for the protection of the U. S.

Goodyear Race Out

The Goodyear Tire and Rubber Company has notified the management of the National Air Races that it will not sponsor the 190-cubic-inch class at the National Air Races in Cleveland this year. The Goodyear Trophy races were a popular part of the race program at Cleveland in 1947, '48 and '49. Whether or not another company will take over this sponsorship is not known at this time. Some are looking to Continental to keep Midget Races going.

Taylor Aerocar

Some time ago the building of a roadable plane by M. B. Taylor of Longview, Washington, was announced. Mr. Taylor is still in the process of developing his *Aerocar* and, according to recent word, he plans to eventually get into production on it. Estimated cruising speed of the *Aerocar* is "over 100 mph," designed road speed (as a car) is 50 mph maximum. Its air range is over 300 miles; its road range is over 500 miles. The wings and tail surfaces are removed as a unit to make the *Aerocar* roadable. Mr. Taylor hopes to be able to sell his roadable plane for $3,000 or $4,000.

Wing Tips

The 1950 convention of the Ninety-Nines will be held at the Fort Clark Guest Ranch, Bracketville, Texas, June 21 to 25. . . . The new Beech *Bonanza* will be equipped with RCA 116 transceiver as standard equipment. This radio supplies long-range VHF transmission and retains standard low-frequency reception, permitting the pilot to navigate on the familiar four-course radio range and to use a direction finding loop for homing and position fixing on range or standard broadcast stations. The radio's loop antenna is enclosed in the tail cone of the *Bonanza*. . . . Delos Rentzel, Administrator of the CAA has been awarded an honorary Doctor of Laws degree by the University of Miami at Coral Gables, Florida. . . . Well-known precision acrobatic pilot Sammy Mason has had two Safe Flight stall warning indicators installed on his *Wasp*-powered Boeing biplane. . . . Shake-up in Piper Aircraft returns some "old-faithfuls" to the scene. Jake Miller is back at his Sales Manager's job, Bill Stroheimer is also back in harness in charge of advertising and publicity, and Walt Jamouneau is again chief engineer. Head of the company is, of course, W. T. Piper, Sr. . . . A report from Aircraft Industries Association—Personal Aircraft Council, shows total shipments during 1949 of personal-plane builders to amount to $14,322,000. Top four are Cessna with $4,545,000; Piper with $3,244,000; Beech with $2,770,000; and Ryan with $1,816,000.

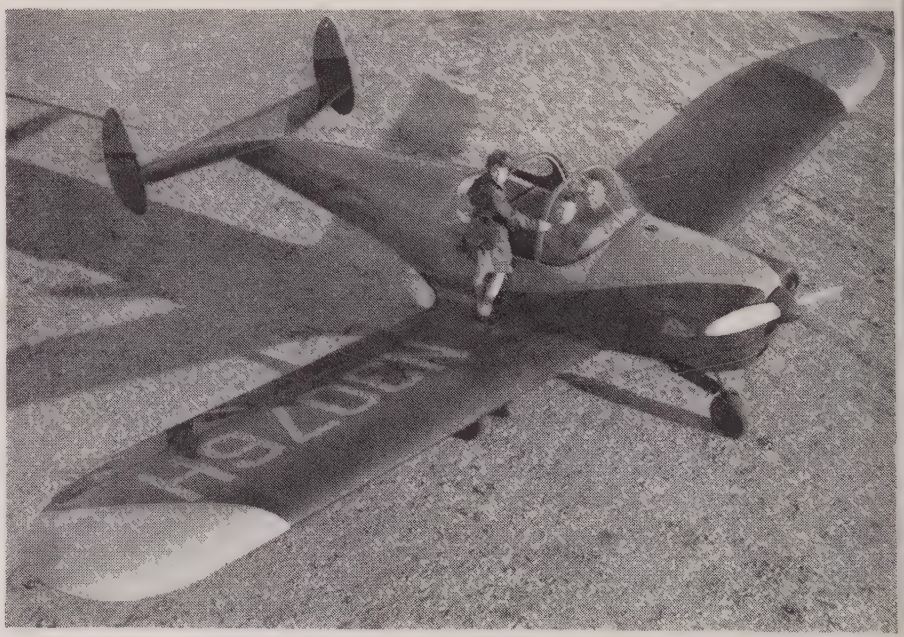
The Stooge

I'm the Co-pilot, I sit on the right,
I'm not important, just part of the flight
I never talk back lest I have regrets,
But I have to remember what the pilot forgets.
I make out the flight plans, study the weather,
Pull up the gear and stand by to feather,
Fill out the forms and do the reporting
And fly the old crate when the Pilot's a'courting.
I take the readings, adjust the power
Handle the flaps and call the tower.

Find our position on the darkest of nights,
And do all the bookwork without any lights.
I call for my Pilot and buy him cokes
I always laugh at his corny jokes.
And once in a while, when his landings are rusty,
I'm right on the spot with a "Gawd, but it's gusty."
All in all I'm a general stooge
As I sit on the right of the man I call "Scrooge."
I guess you think that is past understanding,
But maybe someday he'll give me a landing!

Anonymous

ERCOUPE for 1950 was seen for first time at Sportsman Show in New York. Rudder pedals, eliminated by *Ercoupe's* two-control system, are now optional equipment on 1950 models



Bonanza Inspections Free

Beech Aircraft is again offering free factory inspections for *Bonanza* owners. Especially trained factory service engineering representatives working in teams will make a thorough inspection of customers' planes, then submit to each owner a detailed report listing every part inspected and indicating the condition of each part and specific recommendations, where required, as to any servicing considered necessary. Here is the first schedule of *Bonanza* inspection dates:

EAST

April 6-8 :—Butler Company, Chicago, Ill.
21-22:—Memphis Aero, Memphis, Tenn.
24-26:—Hunter Flying Service, Cedar Rapids, Iowa.
27-29:—Gopher Aviation, Rochester, Minn.
May 11-13:—Wings, Inc., Ambler, Pa.
16-18:—Ohio Aviation, Vandalia, Ohio.
June 5-7 :—Anderson Air Service. Milwaukee, Wis.

WEST:

April 7 :—Arizona Airmotive, Phoenix
19-22:—Pacific Aircraft, Burbank, Cal.
25-28:—Pacific Aircraft, Oakland, Cal.
May 1-2 :—Flightcraft, Portland, Ore.
15-17:—Prairie Airways, Lincoln, Neb.

Girl Flyers

The Florida Chapter of the Ninety-Nines is planning its annual Florida All-Woman Air Show for June 10 and 11. It will be held at International Airport, West Palm Beach. As last year, one feature will be the all-gals air race from Montreal to West Palm Beach.

The annual meeting of the Women's National Aeronautical Association will be held May 18, 19 and 20, at Tulsa, Oklahoma. Over-all theme of this year's meeting will be Air Age Education.

Hitch Your Wagon

Col. Bernt Balchen, C.O. of the Air Force's 10th Rescue Squadron in Alaska, is probably *the* expert in the field of "polar strategy." Col. Balchen also is known as one of the world's greatest life-savers. He has probably rescued more airmen downed in the far reaches of the arctic than any other 10 men. Add to those distinctions the fact that Col. Balchen is one of the most colorful characters aviation has ever produced. "Hitch Your Wagon" is a new book about Col. Balchen. Biographical, it tells the fabulous story of Col. Balchen in a style all airmen will enjoy. It is authored by famed aviation artist and World War I flyer Clayton Knight, and Robert C. Durham. The story is not only a thrilling account of Col. Balchen's doings but it is also the story of aviation. It's exciting . . . and will bring you many a laugh, too. We recommend it as a Grade A addition to your aviation library. Remember *"Hitch Your Wagon," by Clayton Knight and Robert C. Durham; published by Bell Publishing Company, Drexel Hill, Pa. $3.50.*

New Lear

Lear, Inc., makers of aeronautical radio and equipment, has come up with a new portable. Called *Learavian*, it is an all-purpose portable radio capable of providing the greatest pleasure and utility ever offered to an aircraftsman, yachtsman or sportsman. It features three-band reception, and can be used AC, DC, or Battery. It uses built-in loop antenna.

TWA
TWA ...
Only scheduled U.S. airline direct to
ROME
Ask about special low-cost, all-expense Holy Year tours
CALL TRANS WORLD AIRLINE
Across the U.S. and overseas... you can depend on TWA

BECOME A
JET ENGINE
EXPERT

in MAINTENANCE & OVERHAUL

Another "CAL-AERO" FIRST that leads the way... Insure your future—be ready for tomorrow's new type power plants. Write today for special information about CAL-AERO'S NEW JET ENGINE CAREER COURSE. *Start your training now*—Opportunities for trained JET ENGINE MECHANICS are developing with the vast expansion in this new field of propulsion. Ask yourself what other school can offer this specialized course, complete with test cell and LIVE JET ENGINES to study and work upon? The answer is—ONLY CAL-AERO.

★ ★ ★

For 21 successful years, CAL-AERO has been and still is serving the Aviation Industry with progressive and "look ahead" career training—specializing in its major courses in—

AERONAUTICAL ENGINEERING
MASTER AVIATION MECHANICS
...and NOW we add JET ENGINE Maintenance & Overhaul to further insure your future—to EARN MORE MONEY.

Board and Room available
APPROVED FOR VETERANS

CAL-AERO TECHNICAL INSTITUTE
GRAND CENTRAL AIR TERMINAL, GLENDALE 1, CALIFORNIA

MAIL COUPON TODAY

CAL-AERO TECHNICAL INSTITUTE, Grand Central Air Terminal, Glendale 1, Calif. • Send full information and free catalog, immediately.

☐ AERONAUTICAL ENGINEERING
☐ MASTER AVIATION MECHANICS
☐ JET ENGINE—Maintenance and Overhaul

HOME STUDY COURSES

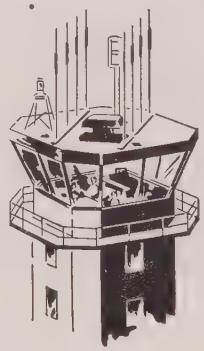
☐ AERONAUTICAL DRAFTING ☐ AIRCRAFT BLUEPRINT READING
☐ STRESS ANALYSIS AND DESIGN

NAME AGE
ADDRESS
CITY ZONE STATE
HIGH SCHOOL ATTENDED GRADUATED: YES ☐ NO ☐
S-5 Check one: ☐ Veteran ☐ Non-Veteran

Pratt & Whitney Aircraft
AIRPORT DEPARTMENT

Rentschler Tower Calling . . .

AIRPLANE
OPERATORS
PILOTS
OWNERS



No one can service the parts of your aircraft quite as well as the original manufacturer. The AIRPORT DEPARTMENT of Pratt & Whitney Aircraft at Rentschler Airport offers you its extensive modern facilities for the

- **OVERHAUL**
- **REPAIR**
- **MAINTENANCE**

of your

PRATT & WHITNEY ENGINES
HAMILTON STANDARD PROPELLERS

Best Because:

1. Only Pratt & Whitney or Hamilton Standard factory-made and warranted new parts are used.
2. Only factory-trained technicians touch your equipment.
3. Only the AIRPORT DEPARTMENT is equipped and staffed to perform all possible repair and overhaul operations.
4. The AIRPORT DEPARTMENT offers you the dependability of a factory-rebuilt engine.
5. Located at Rentschler Airport, one of the finest private airports in the country.

Complete servicing, maintenance, and repair of aircraft and equipment including radio installation are available in our spacious service hangar equipped with the most modern facilities.

FLY IN FOR A VISIT or telephone or send for a pictorial booklet and see why you get longer and better service from your Pratt & Whitney engines and Hamilton Standard propellers when they are serviced by the Airport Department of Pratt & Whitney Aircraft, Division United Aircraft Corporation, Rentschler Airport, East Hartford, Connecticut.

PROP WASH

Aero Oddities

Three-Point Landing. Cessna N75385 was cleared to land on Runway 35. The pilot made an unusually poor landing, followed by three hefty bounces. As the plane finally rolled to a stop, the tower initiated the following call, "385 on the ground at one five . . . one six . . . one seven . . . and one eight." *(D. A. Krupp, Philadelphia, Pa.)*

Tower Clearance. A man living next to a large airport works at a factory located directly across the field. Not valuing the long haul around the big field, the man has worked a deal with the airport tower. He rides his bicycle across the field, halts at the main ramp and runway intersection, waits for a green light from the tower, then makes a quick exit over the nearest taxi strip, off the field to home. *(Cpl. S. J. Allen, Pope AFB, N.C.)*

Rescue Route. Bus driver Calvin Carstens is a pilot, a fact appreciated by a dozen ice fishermen. Recently, an ice floe started carrying 12 fishermen out into the cold Saginaw Bay. Seven times Carstens braved gusty winds and low visibility to fly out over the 75-foot gap, land on the ice floe and then take off again to ferry the fishermen back to safety. *(E. Gentry, Marthaville, La.)*

Light Brigade. A lightplane became lost during a snow storm. Circling around the area between Block Island and the Little Springs Airport, his plight soon came to the attention of the local citizens who quickly gathered together, drove their cars to the local golf course, lighted up the fairway with their headlights, and brought the pilot down to a safe landing. *(H. H. Haddad, Wickford, R. I.)*

Hay Height. It was "wash-out" season at a Primary Training School. Buzzing students, if caught, were immediately given the heave-ho. Upon his return from a practice session, one student was approached by his instructor and questioned regarding the maneuvers he'd performed. The cadet listed 8's up and down a road, S turns, etc., and all at an altitude of at least 500 feet. "How tall does the hay grow around here?" the instructor asked. To which the cadet, a native of that section, went into a Chamber of Commerce speech . . . until, that is, he saw the instructor eyeing his airplane. Clumps of hay still clung to the tail wheel! *(F. C. Drost, Medford, Wis.)*

Feeling Chipper. A *Stratocruiser* was droning 23,000 feet above the Pacific. In the rear cargo compartment a shipment of very much alive chicks were chirping it over. Just forward of this compartment, in the lounge, a woman passenger cocked her ear toward the cargo area, then said to the steward, "Young man, aren't we getting a little low . . . I can hear birds!" *(T. Kay, San Francisco, California)*

Pilot Rating. A group of flyers were discussing an employee of a certain aircraft company who had made his reputation as a pilot many years ago. During the hangar session it was brought out that this old-time pilot had already cracked up four of the company's new airplanes. To which a bank-appointed executive remarked in all seriousness, "Yes sir, he's a good pilot. Why, he's crash landed four airplanes since he's been with us . . . and walked away from each of them!" *(G. Benson, Chicago, Illinois)*

Att'n Readers:

If you have any news note oddities pertaining to aviation, send them to SKYWAYS, Box 17, 444 Madison Avenue, New York 22, N. Y. Five dollars will be paid the sender of each "oddity" printed. Contributions cannot be returned unless accompanied by stamped addressed envelope. The decision of the editors is final.

Add Skyways to your permanent library!

One-year's subscription to SKYWAYS and a handsome book-shelf binder all

for just $5.00

Here is your opportunity to have aviation facts and figures at your fingertips.

Each issue of Skyways represents a new chapter in aviation development. Bound together in this sturdy, book-shelf sized portfolio, a year's subscription to Skyways becomes a permanent record of aviation history. Send today for your own Skyways binder, in durable, attractive blue leatherette, embossed with gold. This month's special double-offer means that you get not only the binder but also one year's subscription to Skyways for a mere $5.00.

Fill in this coupon and mail today

SKYWAYS
444 Madison Avenue
New York 22, N. Y.

☐ Renewal ☐ New

☐ 1 year SKYWAYS and binder.....$5.00
☐ 2 years SKYWAYS and binder..... 7.00
☐ 3 years SKYWAYS and binder..... 8.00

Gentlemen:

I enclose $ for a binder and SKYWAYS for years.

Name_____

Address_____

City _____ Zone _____ State _____

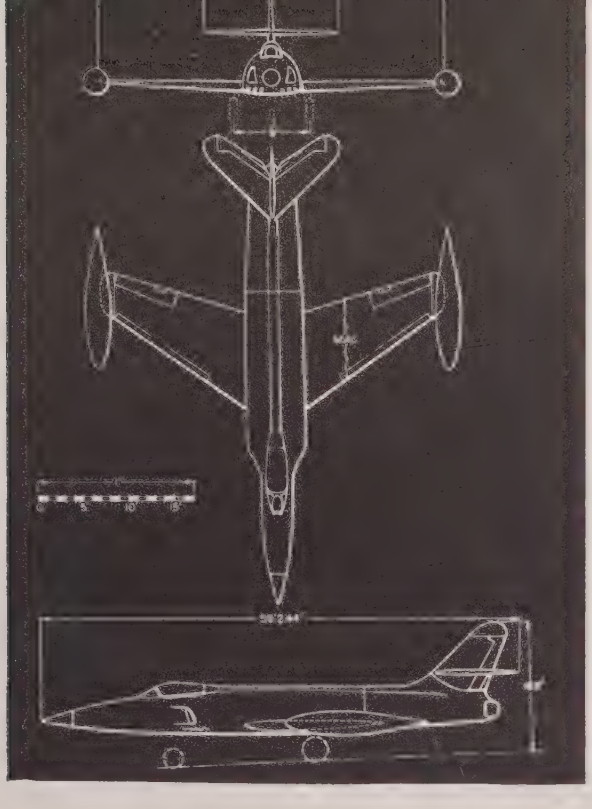
5-50

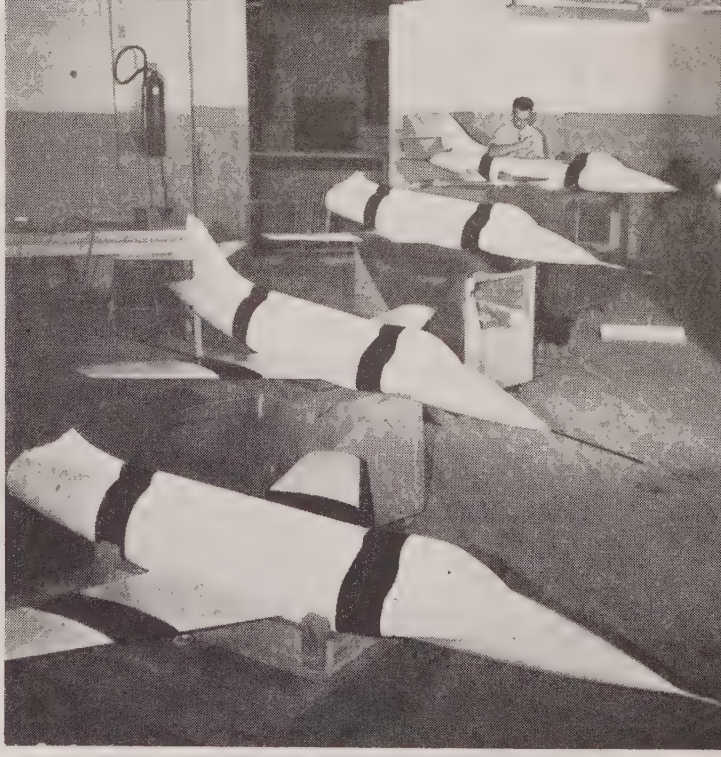
Strike Fighter: F-90

By TONY LEVIER

Chief Test Pilot, Lockheed

LOCKHEED F-90 *(below)* was first flown as scale model fastened to the underside of the fuselage of a P-38 *(left)*





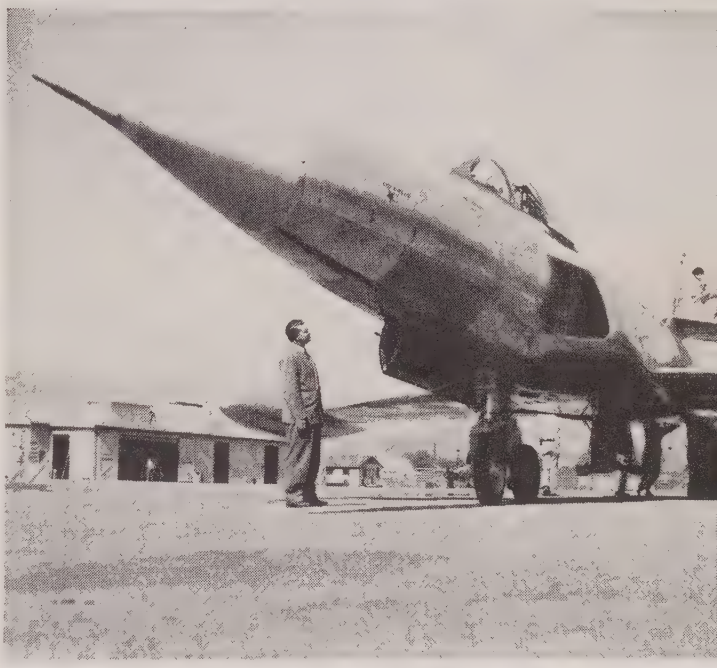
DROP TEST models were made of steel and plastic, and enabled engineers to determine F-90's characteristics

If you like your airplanes big and rugged, you'll go for the F-90.

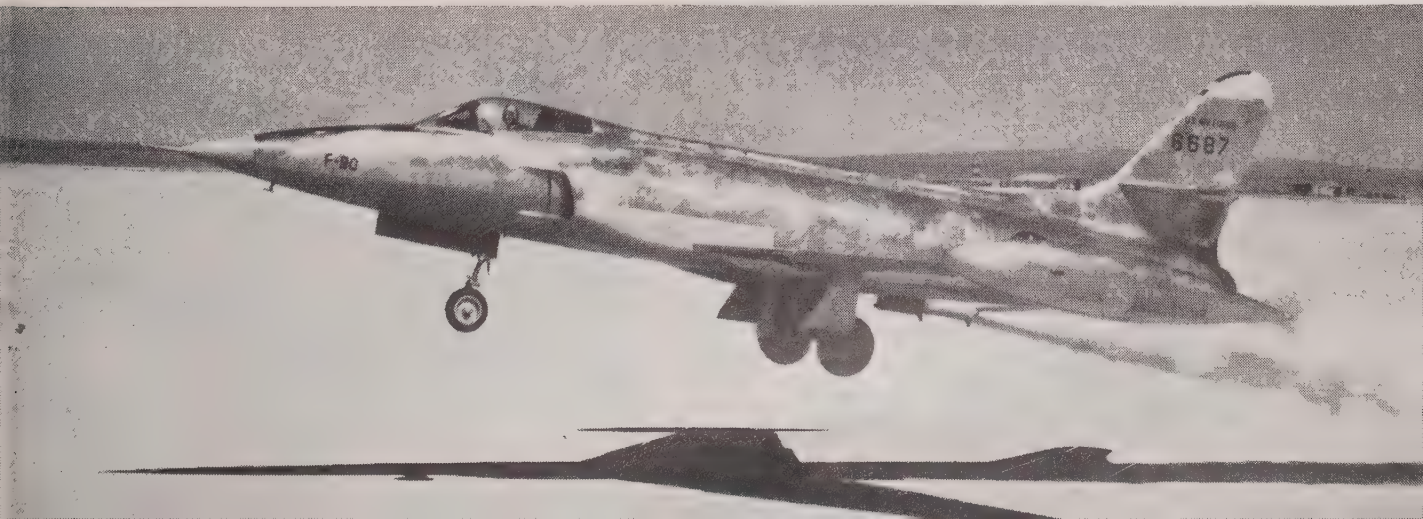
Our newest single-seat penetration fighter weighs as much as the DC-3 that I fly from the factory to the drylake testing field. We can put 24 people in the ex-TWA transport, but there's just room enough for me, a maze of test instruments and fuel in the big F-90.

The fighter is 55 feet long and has a wing span of 40 feet. The wings sweep back at a 35° angle from the sharply pointed needle-nose fuselage. But believe me, the ship handles like a dream, for all her size.

I knew more about the potential flight characteristics of this airplane (*Continued on page 41*)



TAKE-OFF photo *(below)* shows F-90 using RATO bottles. These bottles last for 12 seconds. The F-90 is 55 feet long and has a wing span of 40 feet. Wings sweep back 35° from F-90's sharply pointed needle-nose fuselage



SKY COPS

FLYING WINDMILL belonging to AF with AF officer at controls was used by Rangers to locate strays in hills, etc.

By STEVE ALLEN

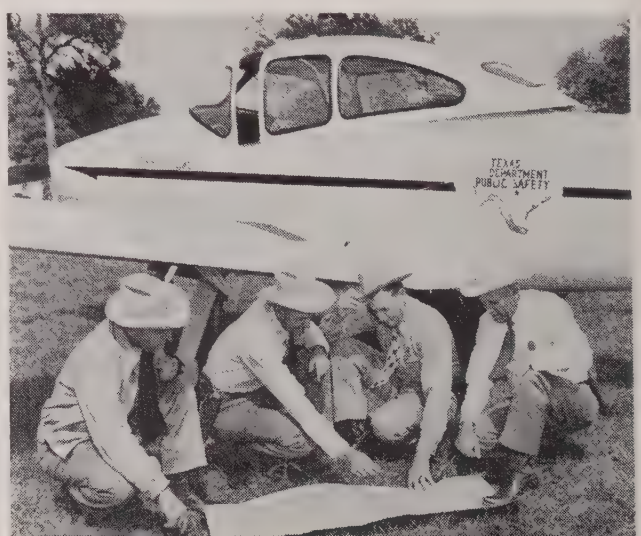
THE Texas Department of Public Safety, embracing the world-famed Texas Rangers and the equally efficient but perhaps less well-known Texas Highway Patrol, has come to the conclusion that "*crime* and the tide wait for no man." Consequently, the Department recently has enhanced its ultra modern law enforcement cadre with a new Ryan *Navion.*

Colonel Homer Garrison, Jr., Director of the Texas Department of Public Safety and Chief of the Texas Rangers, has long been an air enthusiast and a firm advocate of the belief that a progressive police organization must set the pace in the never-ending war against crime, instead of following where criminals have pointed the way.

Recently, the Texas Legislature acted favorably on Col. Garrison's request for an air arm to strengthen the State agency—and the nod went to the *Navion* after a trial demonstration of its potential police value during a recent prison break in which five felons escaped from the Atascosa County jail at Jourdanton, Texas.

At Garrison's request, Bobby Ragsdale, *Navion* dealer at Austin and operator of Ragsdale's Flying Service, picked up Jim Boutwell, a radio operator for the Safety Department, and flew the 110 miles to the jail break scene in record time. There, High-

TEXAS RANGERS look over Sectional map to plot course to scene of recent jail break. Fugitives were found from air.



RADIO OPERATOR Boutwell (*right*) kept ground posse informed of fugitives' movements as law moved in on them

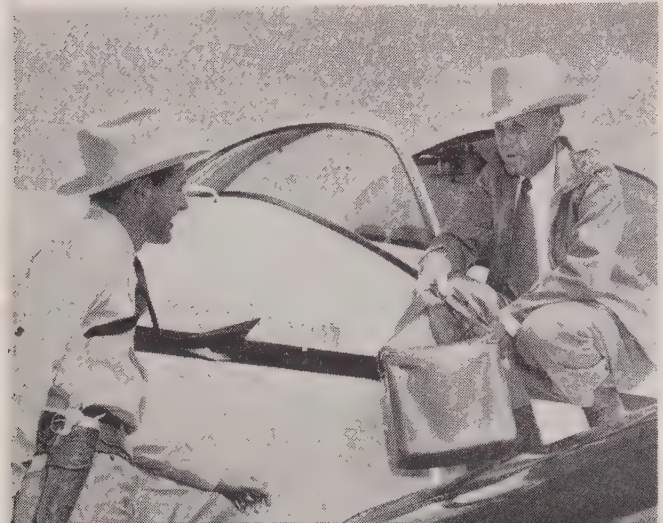
way Patrol Sergeant John H. Hollyfield of the San Antonio Patrol District was taken aboard. His piece of equipment was a walkie-talkie set. The trio immediately began a criss-cross aerial search of the area while on the ground other crews equipped with the portable two-way radios began moving across the terrain where the escapees were thought to be.

Two of the fugitives had already been caught by members of a Ranger and sheriff's posse but the other three, inveterate cattle thieves, had vanished into the brushy expanses. Upon arrival of the plane, however, their freedom was short lived.

Shortly after the take-off, the three members of the airborne posse detected movements on the ground, and the spotters soon nailed the rustlers' hiding place down to a thicket about 20 miles south of the county jail. This intelligence was speedily relayed to the ground forces who moved in on the site, all the while keeping constantly posted on the changes of position of the prisoners by the men in the plane who continued to hover overhead at a thousand feet. The fugitives were quickly apprehended and returned to custody of the county sheriff —clinching proof of the plane's value in law enforcement. An order was (*Continued on page 58*)

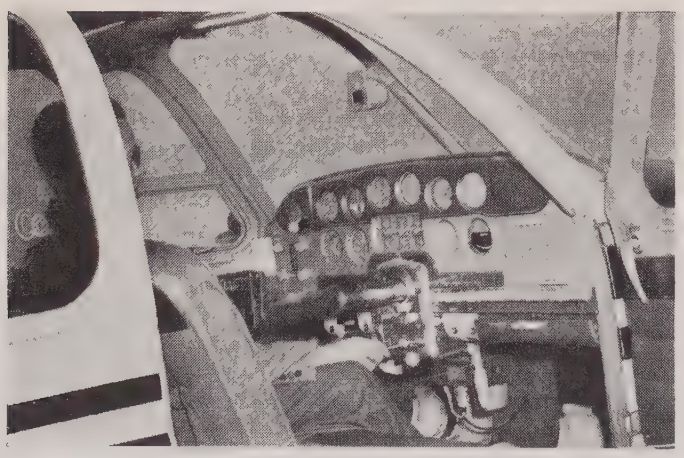
PILOT of the Rangers' new *Navion* is Max Westerman (*above*), a Texas Ranger who's logged 3,000 hours and was pilot during World War II. Westerman flew the ship on recent man-hunt, spotted fugitives in area shown below

BOSS of Headquarters Company of Texas Rangers is Capt. Fred Olson (*on wing*), here talking to Doyle Curington



Pilot's Report: New Beech Bonanza

BEECH BONANZA, 1950 model, is shown here coming in for landing at Goleta Airport. Note longer flap extension on new model *(above)*. Panel on the new *Bonanza (below)* is well worked out. Flight gages are directly in front of pilot



PLANE-OWNER George Hammond brought new B35 in on his own 1300-foot strip, demonstrated how to get off again

By DON DOWNIE

You needn't buy any "extras" for the new Beech *Bonanza.*

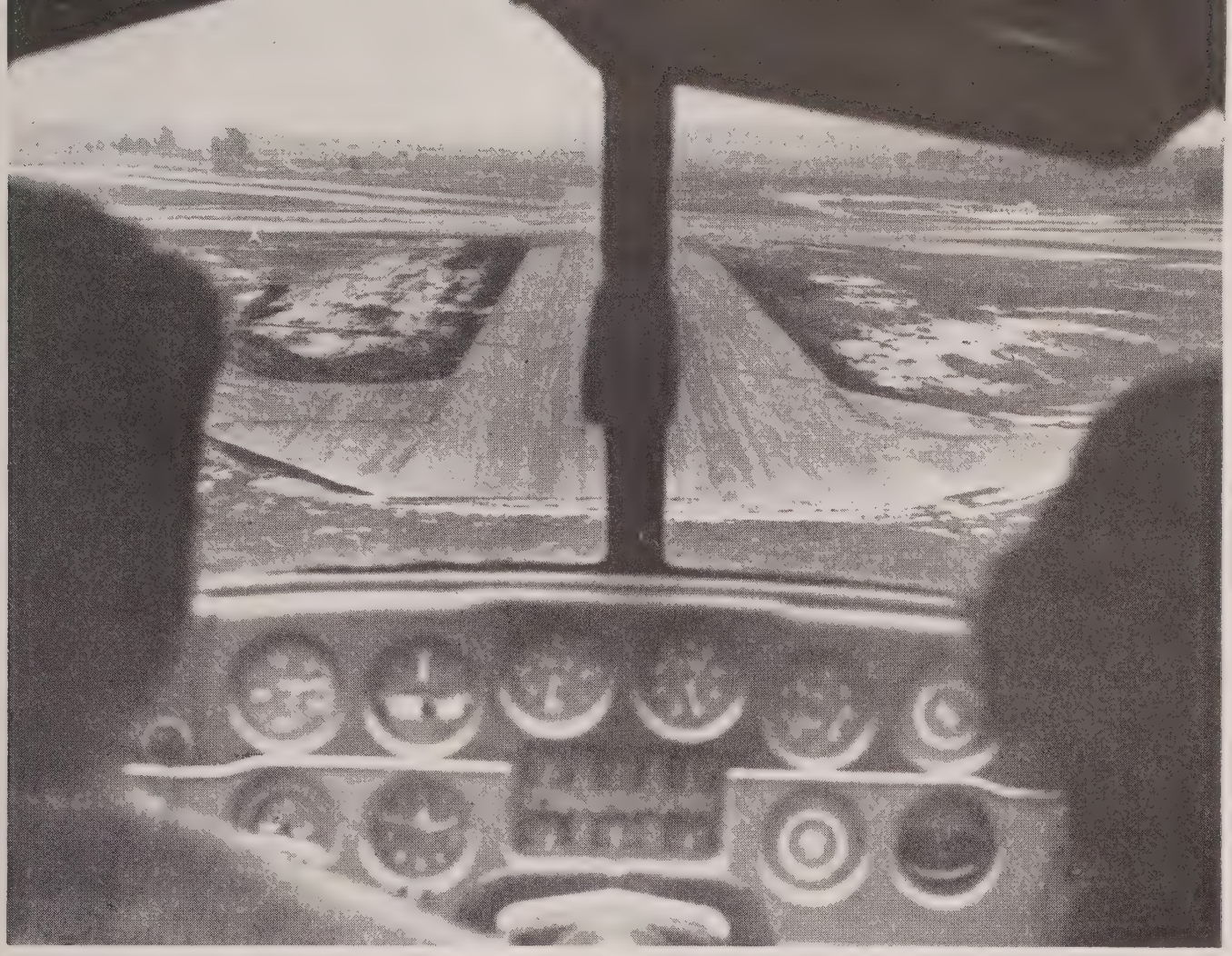
As it comes off the assembly line, the latest stock model *Bonanza* B35 is a more complete airplane than many super-special jobs with a mile-long list of expensive accessories.

Two-way radio, throw-over dual controls, heater, recording tachometer, stall-warning indicator, marker-beacon receiver and aural-null loop, variable-pitch propeller, manifold gage and sensitive altimeter all come as standard equipment on the $11,975 factory flyaway price.

"Why not come along when I take the new *Bonanza* to Santa Barbara to demonstrate it for some new sales prospects?" asked Norm Larson, California Beechcraft distributor. When he isn't busy demonstrating *Bonanzas,* Mr. Larson is Secretary of the California Aeronautics Commission.

"You'll have a chance to fly the new ship on a short cross-country hop and then can take it into some of the smaller airports in that area," added Mr. Larson.

When he said "smaller" airports, he wasn't kid-



VISIBILITY remains excellent in new model *Bonanza*. This photo was taken from backseat on final approach to Goleta

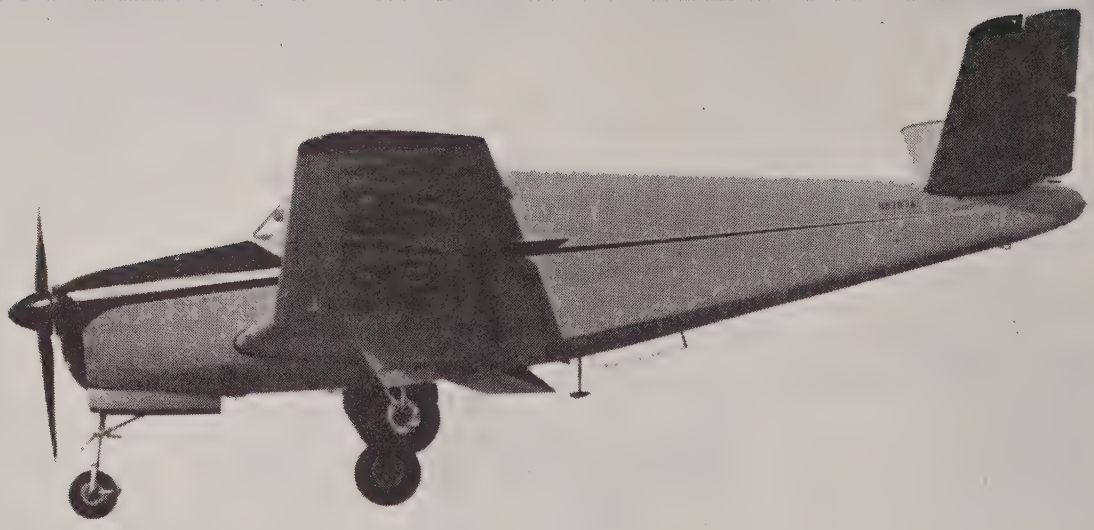
ding. We made one landing on a 1300-foot private strip without using brakes, and then took off over the blue Pacific Ocean from a runway only 1,000-feet long.

The cross-country part of this *Bonanza* trip was from the Monrovia Airport just east of Los Angeles to Santa Barbara's huge Goleta Airport and return. The hop scales out on the map at 106 miles. We spent 43 minutes in the air, including flying a leisurely out-of-the-way traffic pattern at each end of the flight. In spite of the time wasted in leaving the Monrovia Airport in a traffic pattern that led directly away from Santa Barbara, climbing to 5,000 feet and then dropping down to land on runway "7" at Goleta—the strip directly opposite to a straight-in approach from the east—we averaged 148 mph. There was a high overcast and the wind was virtually calm. A pilot should have no difficulty in obtaining the 170-mph cruising speed at 8,000 feet, claimed by the factory.

Before taking off from Monrovia, Mr. Larson briefly pointed out the most important changes in the newest *Bonanza*. "There are actually 18 new improvements on this ship. On take-off, you'll notice more power. We're now turning 2450 rpm's and pulling 196 horsepower compared with 2300 rpm and 185 horsepower on the older ships.

"On take-off and landing, you'll find that both the gear and flaps work faster. We've cut the time on gear retraction from (*Continued on next page*)

PRIVATE AIRSTRIP on beach at Santa Barbara calls for a "sub-zero" approach over water, below level of diving board



LANDING GEAR is stressed to withstand vertical descent of 600 fpm. New *Bonanza*'s gear and flaps operate faster

13½ to 8½ seconds. Full flaps will drop in 7½ seconds instead of 11 seconds on the older ships. The flaps will now go down 30° instead of the 20° on the older ships. You'll appreciate that added flap on short-field approaches.

"The propeller on this ship is a constant-speed unit. You can pre-set the rpm you want to use and that's what you'll get—regardless of airspeed. On take-off, put the prop control in 'automatic' and turn the knob to full high rpm. That'll give you 2450. Then as soon as the gear comes up, turn the knob back to 2050 rpm and forget about it. The constant-speed unit on this prop costs an added $360. But even for a demonstrator that must have just about everything on it but the kitchen sink, that prop unit and a full canary yellow paint job are the only additions I have made to this ship. The paint job costs $275 and I advise all my customers to order their ships that way. I feel that the paint job plus waxing more than pays for itself in the six months that I generally keep a demonstrator. When you figure the cost of a wash job every few days, not counting the deterioration from salt-air corrosion close to the ocean, the paint job is a good bargain.

"If you have that new prop control figured out, climb into the left seat and let's go," said Mr. Larson.

The *Bonanza* has a throw-over control column so that either pilot may fly. One mighty nice feature is the high-low setting on the wheel so that you can drop the controls almost into your lap or fly with them five inches higher—whichever feels more comfortable. The control wheel has been re-designed to conform to the latest safety recommendations of crash research boards. There are four arm rests and any pilot who has ever flown an older model *Bonanza* on a long trip will be mighty thankful for this little addition.

There are dual rudder pedals, but the brakes operate only from the left seat. The right-hand set of pedals will retract flush with the floor when the front-seat passenger does not wish to fly.

Three of us climbed into Mr. Larson's new demonstrator, N8787A. Our back-seat passenger on this SKYWAYS' pilot report (*Continued on page 44*)

BEACH AIRPORT, privately owned and used by George Hammond, is visible here in front of N8787A's right wing

DISTRIBUTOR Larson points out new negative-cambered trim tab which makes ship easier to fly hands-off in rough air

New Soviet Jet Fighter

NEW JET FIGHTER reported to be in production for Soviet Air Force is said to be *Yak-21*. Wing has a 40° sweepback

By WILLIAM GREEN

Despite fragmentary details and unofficial reports of advanced Russian jet-types published from time to time, main public opinion, based on equipment seen in the Russian-controlled zone of Germany by various observers, seems to be that the bulk of Russian first-line aircraft are still piston-engine powered and thus obsolete, compared with current United States equipment. That United States and British Intelligence does not take this hopeful view is proved by two recent events. First is the behind-scenes furor in Intelligence which followed the first release of details of Russian jets about a year ago. The second is the recent boosting with jet-power pods of the B-36, giving the impression that USAF planners are not satisfied (*Continued on page 49*)

NON-STOP AIR TRIP to Oslo from Fairbanks was made via Great Circle route. Much of the trip was above the clouds

Alaska to Norway... Non-Stop

HOME AGAIN, crew of C-54 that made 3,980-mile trip greets reporters, photographers. Col. Bernt Balchen *(below)* is commander of 10th Rescue Squadron. Maj. Gen. F. Armstrong Jr. is C.O. of Alaskan Air Command *(above, left)*

By COL. BERNT BALCHEN

As Told to Lt. Col. Wm. J. Morden, USAF. Ret.

On September 17, 1949, famed Polar flyer Col. Bernt Balchen, commander of the 10th Rescue Squadron in Alaska, flew from Alaska to Norway in 22 hours and 30 minutes. It was the longest flight ever made in a C-54 and the first time anyone has flown non-stop from Alaska to the European mainland. Here is Col. Balchen's personal story of that flight.—Ed.

I guess you could call our Alaska to Norway trip a "hurry-up" affair. On Friday, September 16, I was handed a teletype message from Headquarters, U. S. Air Force, Washington, D. C. Briefly, it allowed us to accept an invitation from the Norwegian Aero Club at Oslo, Norway. This organization had asked us to participate in an airshow it had arranged at Oslo's Fornebu Airfield. The time? On Sunday, September 18—two days later!

I immediately had a conference with Brig. Gen. (now Major General) Frank Armstrong, Jr., com-

TERRAIN over which the C-54 flew on much of its flight to Norway was rugged and barren like this shown here

manding officer of the Alaskan Air Command, and the general not only found the plan interesting but decided he'd go along on the trip, too, since he wanted to make a study of the routine of a long-range flight across the polar regions.

We decided to make the flight as an ordinary "routine turn-out" of the type that the 10th Rescue Squadron must always be prepared to fly on short notice. Except for two officers on the staff, Lt. Col. Eugene Strouse and Major Eugene Douglas, whom I wanted on the trip for specific reasons, none of the others were hand picked for the occasion. As usual, officers who were first for duty were used. They happened to be: Capt. K. Lennart, aide to Gen. Armstrong and former 10th Rescue pilot, Capt. Shearer, Lt. Radzinski and Sergeants Weber, Farmer and Schraeder. We were 10 altogether, including the general.

The officers were summoned to a briefing 12 hours before take-off. We had planned to go direct from Fairbanks to the North Pole and from there to Oslo, but in studying our weather maps we discovered the route over the Pole put us nose-to-nose with some pretty stiff headwinds. Instead we decided to go by the Great Circle route from Fairbanks to Oslo. On this course we would miss the Pole by 10° and avoid the headwinds. This second route had another advantage, since we would gain time by some tailwinds north of Canada and over northern Greenland.

All the necessary arrangements were made. We loaded the plane, spare tanks included, with about 4,400 gallons of gas—enough for an estimated 26 hours of flying. We brought the crew to Fairbanks from our Headquarters in Anchorage and at 16:25 P. M., local Norwegian time, on Saturday, September 17, we took off. Hardly anybody but our own people knew about the long-range flight.

The plane was heavily loaded, but we took to the wings very quickly. From a tourist's point of view, a flight like this one holds no special sensation. The northern part of Alaska and the Canadian Archipelago are monotonous landscapes, flat and barren. Ice covers the polar basin as (*Continued on page 58*)

10TH RESCUE'S C-54 was loaded with 4,400 gallons of gas, enough for 26 hours flying. Trip took 22½ hours

WAR-SURPLUS PLANES have been found too expensive to operate and many of them end up in junk heaps after useable parts have been removed

AUTHOR Ed Hoadley swapped a Culver and Ryan for this Fairchild, then found its engine in bad shape. Result—author is stuck with overhaul

WHAT'S IN A TRADE?

These are pitfalls to avoid if you swap your airplane

By ED HOADLEY

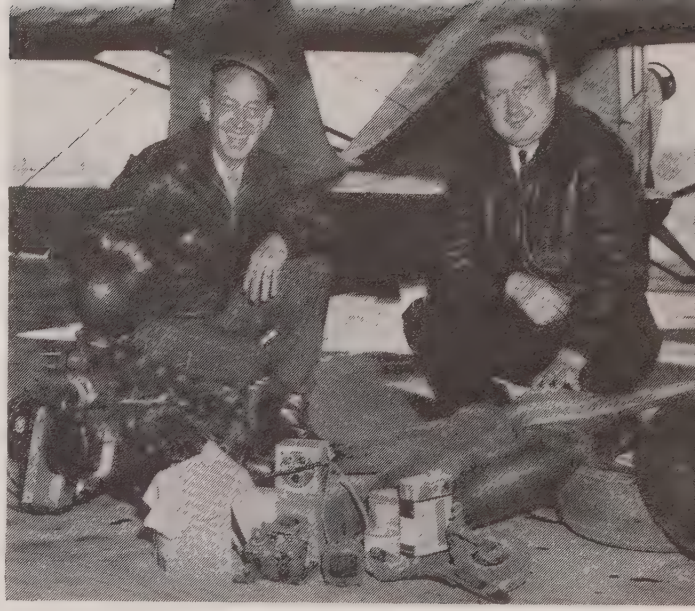
Aero Traders, Unlimited

PLANE fabric must be checked carefully. Note fabric and dope deterioration here

LAST week a pilot dropped into my airport and wanted to trade his extra 65-hp Continental engine. After much discussion, I took the old engine, and he received a Sensenich 65-hp propeller, a Continental carburetor, a Motorola portable radio, an Air Corps compass, two used Aeronca tires and tubes, an Aeronca tail-wheel assembly complete, a yard of grade "A" fabric, 10 feet of surface tape, a quart of dope, five ounces of aluminum dope, a pint of thinner, and free advice pertaining to the installation and application of each. He had no use for the extra engine, but since he owned a used Aeronca *Champion*, he had need for the items I traded to him. Herein were the elements of a successful trade. Both parties had traded something they didn't want or need, for something they did want or need.

One of Webster's definitions of the word "trade" states; ". . . dealing by way of sale or exchange . . ." Roget's *Thesaurus*, American Edition, gives us a group of related words: "Interchange, exchange, . . . reciprocation, transposal, reciprocity and, of all things, hocus-pocus. . . ." How this last got into the picture we shall see later. In law school, Professor Williston used three very famous Latin words, "*quid pro quo*," which I believe translates as, "this for that." Use any definition you wish, it boils down to exchanging something you don't want for something you do want. In airplanes it boils down to either a fascinating or gruesome science, depending on your skill and luck.

I shudder to think of the four thousand years behind us, when every man was a prospective purchaser or trader of horses for transportation. How horrible it must have been to trade a pretty decent riding horse of your own for one that looked so much better, yet turned out, subsequently, to be lame in the right foot and have false teeth. A few years ago my brother bought a registered riding horse for 30 dollars. What a bargain she was. Only the following week she died of old age. Airplanes are a transportation and sport commodity which will be more and more exchanged in the manner of horses as time goes by. Airplane trading has all the fascination of horse trading, and certainly all of its thrills and attendant chances of exchange error.



PARTS TRADE can be profitable. Author (*left*) traded a prop, compass, tires, etc. for 65-hp Continental engine

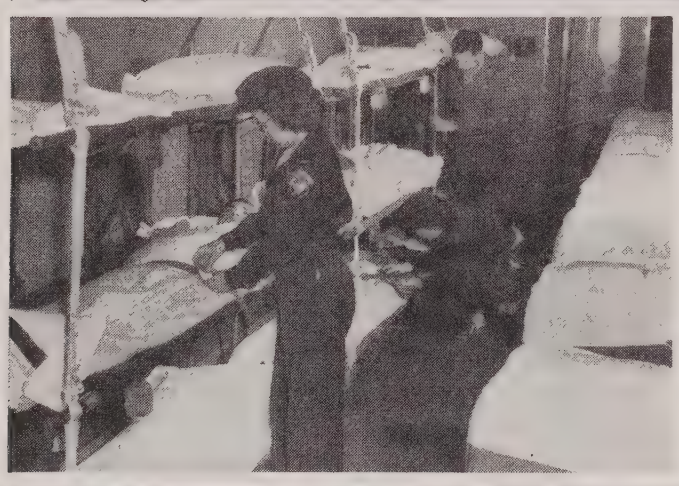
Before the war, on one of my earlier trades, I received a 50-hp Piper *Cub*. She was a beauty, but I flew her only a few hours before discovering one of the rear spars was cracked for a distance of three feet. My repair bill on that airplane amounted to $435 and some-odd cents. Current value on said airplane ran about $800. I figured I had around $600 in the airplane. Thus, to my consternation, I ended up with a total investment of $1035 plus the loss of potential sale for several months. That was a good lesson in horse-trading.

If you are thinking of joining the ranks, here are a few "rules" which might be followed to advantage:

1. Inspect the airplane from stem to stern and back again. Believe that the other party is one of the darndest liars there ever was. Rely only on what you can see. Diagnose (*Continued on page 48*)

VETERANS AIRPORT of Bloomington, Indiana, is home base for the author's profitable airplane and parts trade business

LIFE LINE to EVERYWHERE



MILITARY AIR TRANSPORT SERVICE operates eight *Constellations* (*above*) on Atlantic run. Other equipment includes C-47's, C-54's, C-74's and C-97's. *Connies* are air evacuation planes, with stretchers for patients, passenger seats

MATS is more than military service; it is international goodwill agent

By J. FRED HENRY

WORLD ROUTES are shown on map (*below*). Atlantic Division takes in Ankara and Dhahran; side routes tie-in Iran

WESTOVER AFB is headquarters for MATS' Atlantic Division. Westover celebrated its 10th Anniversary in '49. Overseas passengers (*right*) are briefed on latest emergency equipment carried by MATS aircraft, prior to their take-off

AMERICA'S responsibilities in enlightening world leadership have become unmistakable during and since World War II. As England learned how to provide this leadership by development of the sea routes, so Uncle Sam has been learning via the air routes. America's lifeline to these new and heavy responsibilities can be summed up in one word—MATS.

For nearly two years the Military Air Transport Service has been operating a great chain of air bases around the globe, serving the Department of Defense. MATS, however, is more than a military air service. It is an international agent of goodwill, and often many of the diplomatic and civil requirements far outweigh the military angle.

A few weeks ago I was privileged to fly to Europe via the Atlantic Division of MATS on special Air Force orders. While the object of the trip was to get editorial and photographic material on our Air Force activities, it also gave me the opportunity to see at first-hand something of MATS' world-embracing operation. In sharing a few of these experiences, we believe that our readers will catch something of the vital importance of the job MATS is doing in a confused (*Continued on page 47*)

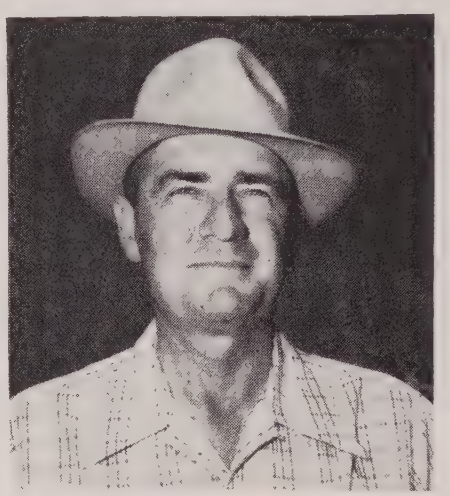
TRAVELERS from all services are passengers on scheduled MATS flights that take them to all corners of the globe

Flights of a Farmer

Secret of success in large-scale farm operations is in keeping step ahead by plane

The trick in successful large-scale farm operation, according to Ray C. Henning, of Bakersfield, California, is in keeping a step ahead of everybody else. Certainly Ray Henning should know, for he's considered one of the most successful farm operators in the country. And when he takes the bows for that distinction, he does so in the direction of his airplane . . . . his own particular tool of success.

A recent example of how the affable Mr. Henning maintains his "step-ahead" position in farming was in his introduction of a new Ranger alfalfa seed. That seed was known to be exceptionally valuable for two reasons: 1) the new alfalfa had proved to be extremely winter hardy in the north central states, giving farmers a late season crop not previously possible in that clime, and 2) the crop produced from the Ranger seed for commercial hay production had exceeded any other variety previously used. Those were good reasons in Farmer Henning's book for getting some of that seed.



PLANE OWNER Ray C. Henning of Bakersfield, Calif., rates plane as a profit

Late last summer Henning contacted his county farm advisor and reported his plans for the seed. He also stated he'd fly to any spot in the States to get a supply if it could be located and if the seed would be approved by the University of California's College of Agriculture Certified Seed Dept.

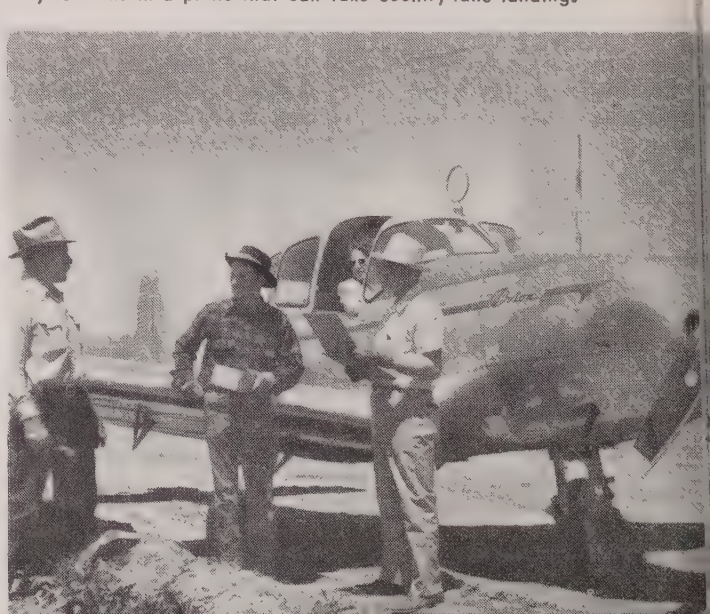
The county farm adviser went to work and after some "digging" located five acres of cured but not thrashed Ranger alfalfa seed in Montana. The owner, Joe Muggli, was prevailed upon to thrash the seed immediately, and to make it available to Ray Henning.

Getting the news of the "discovery," Henning set out in his *Navion* to pick up the 400 pounds of seed promised him. Its pick-up spot was the Miles City Airport at Miles, Montana.

Henning left Bakersfield on Saturday and landed at Bozeman, Montana, that same afternoon. Then he conferred with the man who had actually located the seed for him, Ralph Mercer of the University

FARMER HENNING and his daughter flew to Miles, Montana, distance of 1,300 miles, for scarce Ranger alfalfa seed

CROP CHECKS are important to a farmer, but they are easy to make in a plane that can take country-lane landings



HENNING'S first *Navion* was North American-built (NC 91495). New one *(above)* came off Ryan line in September

FAMILY PLANE as well as work plane, the Henning *Navion* often is used to fly entire family on air trips

of Montana's College of Agriculture, and Art Kegel, Farm Advisor at Miles City. The next morning, Henning flew up along the Yellowstone River to Miles City where the seed was ready and waiting.

The seed loaded into his ship, Henning spent the rest of the day with the farmer in his fields studying his crop methods and *(Continued on page 56)*

FARM OPERATIONS are coordinated by plane. Henning flies from Bakersfield farm to Tehachapi farm in few minutes

Air Photos Pay Off

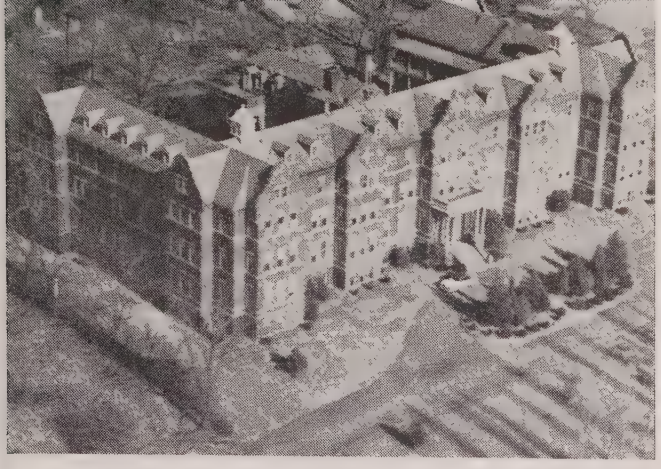
AIR PHOTOGRAPHER Burrows (*below*) calls the Piper *Cub* one of best planes from which to take air shots. With pilot flying from rear cockpit, Burrows sits in front seat, takes pictures as they show up in his glass view finder

Air photographer claims there's easy money and lots of fun in taking pix

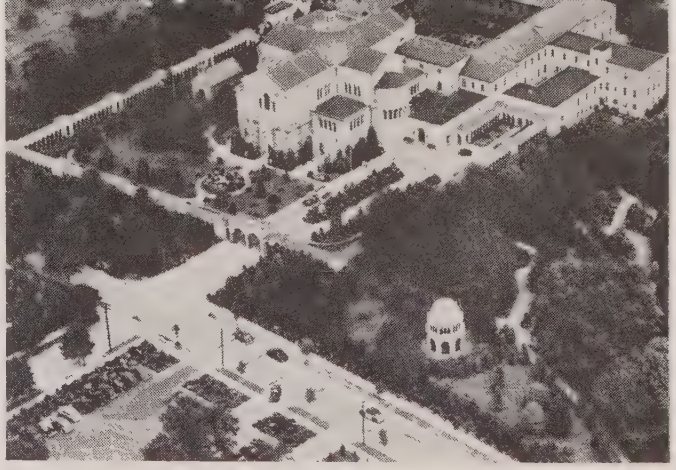
By H. J. BURROWS

IT'S a wonder Sunday Pilots aren't falling all over themselves in an effort to grab some of this easy air photography money. Most airports have frequent calls for air photos . . . and so very few have the small amount of equipment needed, the know-how or the initiative to take the pictures. In short, in most localities aerial photography is a vast virgin field, practically untouched if you take into consideration the number of potential customers. If you don't believe the customer potential is great, find out for yourself. Fly down any road in any community for 30 minutes and I'll bet you'll spot no less than 50 prospective customers—estate owners, tourist-home operators, farms, roadside

SLOW SPEED of Piper planes make them perfect for aerial pixs. Recommended altitude: under 800 feet in open country



REAL ESTATE photo was taken from 500 feet in good sun. Film was Super XX; 1/300 second, lens at f.8 with filter



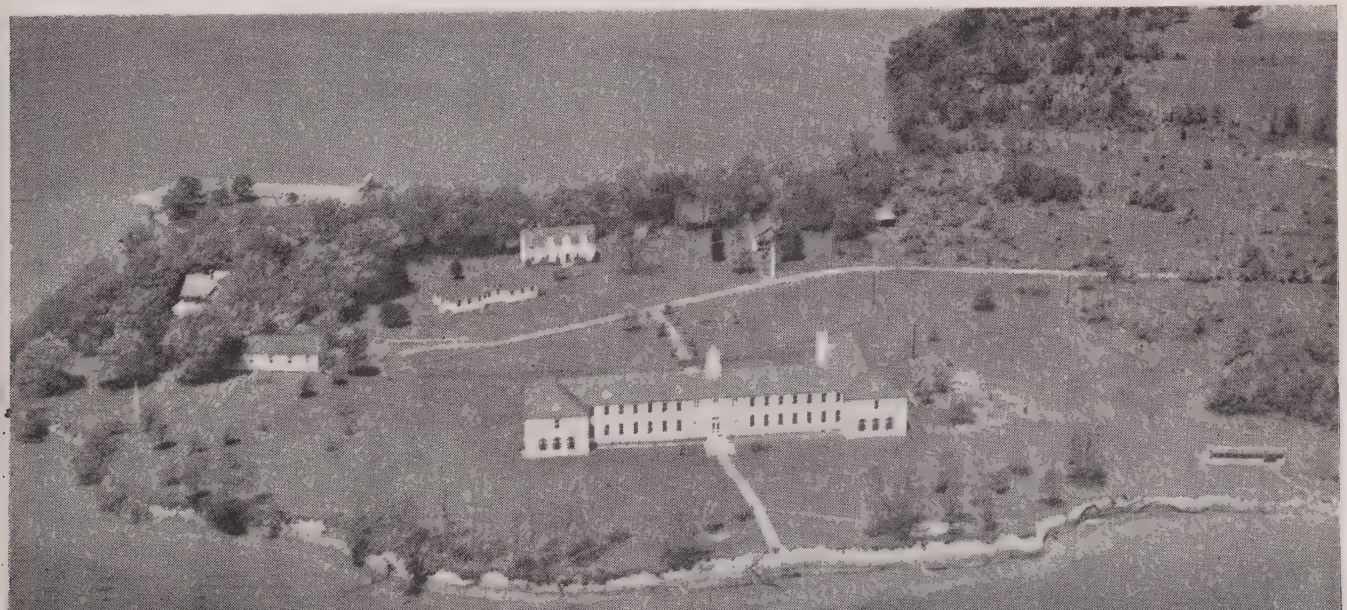
MONASTERY photo was made under overcast conditions, lens at f.8, 1/300 second, medium filter on Super Pan Press film

restaurants, filling stations, factories and a host of others. Nine out of 10 of these will pay out hard cash for good air photos *if* a bit of salesmanship is used. Some will want picture post cards of these air photos for their customers. That's good 'cause their cost is cheap and you can make a nice profit on them.

With an initial investment of approximately $100 and a bit of practice, it is quite feasible to earn $200 weekly right from the start. This amount represents just three or four small jobs. If you hustle, you can easily double it and maybe even turn up a $15,000 to $20,000 yearly business. This $100 figure represents all costs incidental to getting started and includes cost of camera, cost of its conversion to aerial use, filter, initial supply of film, advertisement in phone directory, advertising post cards and mailing. Where else but in aviation can one with no previous training so establish himself in a profession in 10 days time? Particularly one that will pay off in such a handsome manner and, at the same time, afford the exhilaration of "working in the sky" independent of bosses, time clocks, unions or strikes. (*Continued on page 53*)

CAMERA recommended is Graflex, 3¼ x 4¼, with Tessar lens. Author modified it with handles, view finder, new tripper

POST CARDS made from this photo cost photographer only $6.70 per hundred, sold them to institute at big profit

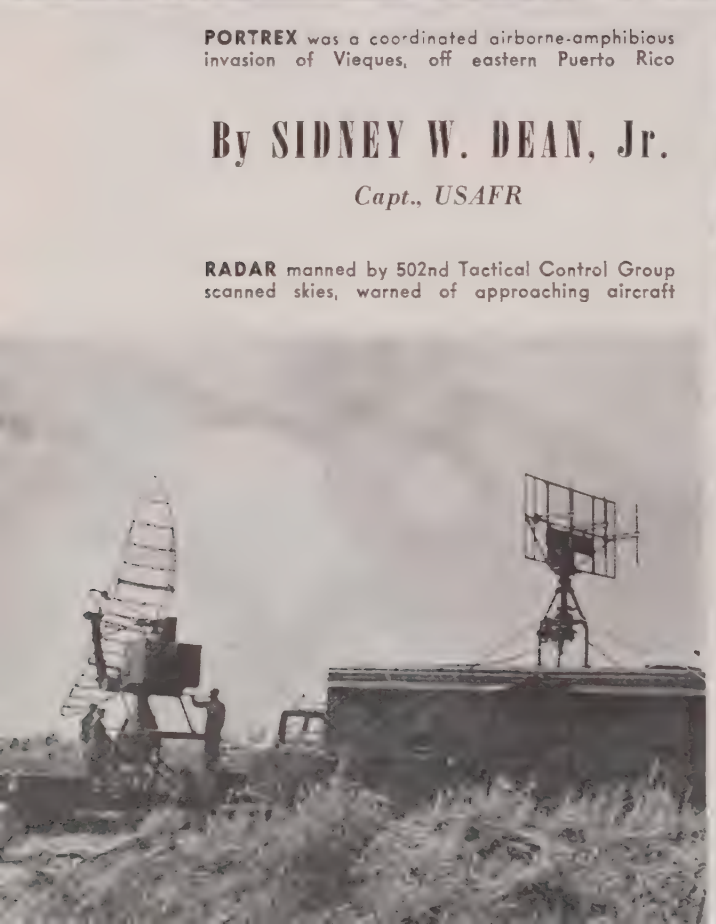


Thunder over the Caribbean

PORTREX was a coordinated airborne-amphibious invasion of Vieques, off eastern Puerto Rico

By SIDNEY W. DEAN, Jr.

Capt., USAFR



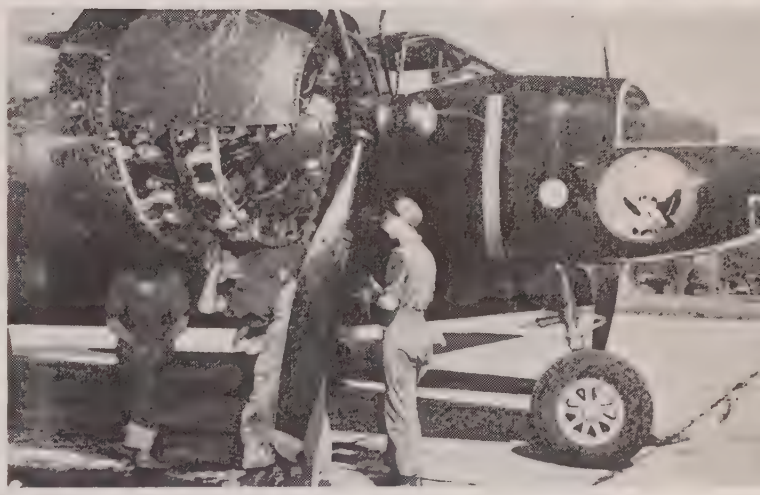
RADAR manned by 502nd Tactical Control Group scanned skies, warned of approaching aircraft

COMMANDERS of maneuver were Maj. Gen. Lee, Vice Adm. Duncan, Adm. Fletcher and Brig. Gen. C. E. Ryan

OVER a land and sea area of 500,000 square miles, our armed forces have held the largest peace-time joint amphibious exercise in history. Air power thundered in the roar of great paratroop carriers, the scream of land- and carrier-based jet fighters, and the ceaseless engine beat of combat, search, and reconnaissance patrols.

AGGRESSOR FORCES sent four P2V *Neptunes* out of NAS Roosevelt Roads to seek out and strike the U. S. Fleet as it bore down on Vieques Island with Invasion Forces. At Ramey AFB *(right)* the "paddle fleet" kept them flying

"PORTREX," code name for the joint Puerto Rican exercises just completed, was a coordinated airborne-amphibious invasion of the island of Vieques, involving 80,000 men, 150 ships and 600 aircraft. Vieques, just off the eastern tip of Puerto Rico, was considered a land-mass defended by a small "Aggressor" force (*Continued on page 50*)



ARMY manned the Aggressor Forces' 50-cal guns on Vieques Island, overlooking the Blue and Red Beach areas

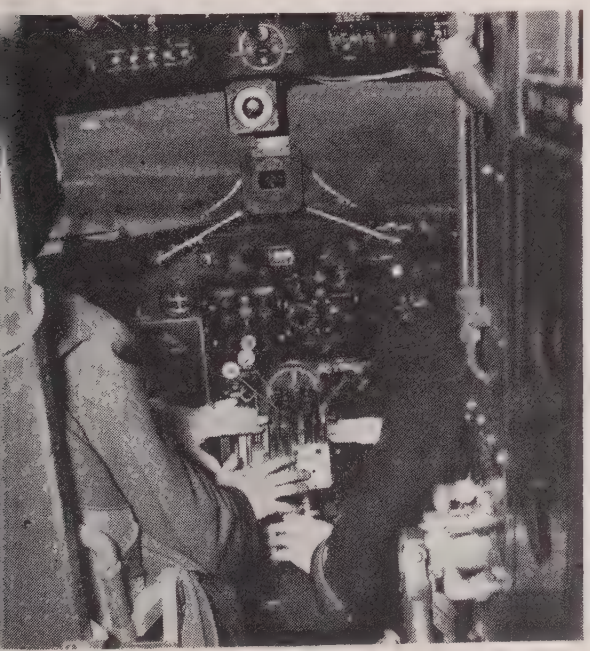
PILOTS cannot judge angle of attack accurately. As a result pilots fly nose high, burn too much gasoline

Angle of Attack

ANGLE-OF-ATTACK indicator mounted on private plane would enable pilot to fly at best cruise speed angle

CROSS BAR where Wrights mounted their "angle of attack" strip of fabric is clearly evident in this flight photo

NAVY research C-47 is equipped with "angle-of-attack auto pilot." Device that reads angle is on end of the boom



Development of angle-of-attack meter may be answer to stall-spin mishaps

By V. A. PREVETTE

AS soon as we catch up to the Wright Brothers we will be on our way toward decreasing our stall-accident rate. The Wright boys knew there was only one way to detect the approach to a stall under all conditions of load, speed, bank and centrifical force—and that was through the angle of attack.

Their angle-of-attack indicator was as practical and simple as any gadget I have ever seen. Mr. Paul Garber, Curator of the National Air Museum, showed me the Wright angle-of-attack indicator on the first Wright plane purchased by the Army (1909) and now displayed at the museum. On the front cross bar, between the skids and about six feet ahead of the pilot, there is a limp, narrow strip of fabric. If in flight this fluttered parallel to the horizontal framework, the pilot understood that his angle of attack was about zero. When, for any reason such as gust, added load, angle of bank, etc., the angle of attack increased, the strip of fabric assumed an upward angle, showing almost exactly the angle between the relative wind and the wing, thus warning the pilot that his angle of attack was mounting.

"This is positive evidence," Mr. Garber told me, "that as early as 1909 an angle-of-attack indicator was used on a Wright airplane." He further stated that it was reasonable to assume that it was devised earlier. Possibly in 1904 or 1905!

As late as 1914 an angle-of-attack indicator, or as they were known then—a "line-of-flight indicator," was present on a Navy *Curtiss* flying boat. This *Curtiss* was used in the military operations at Vera Cruz. The line-of-flight indicator helped to detect slips and skids as well. Awarded in the form of a pennant when the plane was commissioned, the line-of-flight indicator was placed forward of the pilot on the bow of the hull.

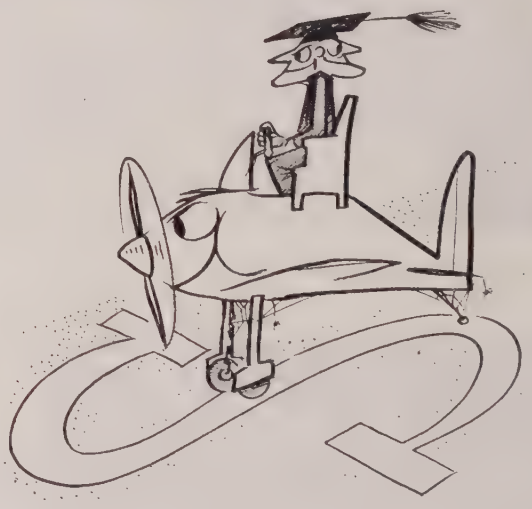
A young commercial test pilot, now Commander Edwin Saxman, Jr., USNR, began experimenting with angle of attack as (*Continued on page 63*)

HANDS OFF the controls on final to landing, pilots of Navy C-47 let "angle-of-attack auto pilot" do the job

DILBERT

By S. H. Warner and R. Osborn

Taxiology—If the word isn't in your dictionary, it should be; and the definition should read: "*the art and science of steering aircraft as they move along the ground or on the water under their own motive power.*" What's more, this is one branch of science in which every aviator should be required to qualify for the degree of BT (Bachelor of Taxiology) before being issued a pilot's license.



The need for this is manifest by the fact that the great majority of all taxi accidents occur because of the inability of pilots to so steer their airplanes as to avoid collision with other planes, vehicles or equipment. To further accentuate this senseless waste, CAA should also establish two higher degrees: MT (Master of Taxiology)—qualification requirements to include 2500 hours flight time with no taxi accidents; and DTS (Doctor of Taxiological Science)—5,000 hours (*Continued on page 64*)

1. Should you leave your cowl flaps open or closed after stopping your engine?

2. Why is it necessary for instrument pilots to be proficient in flying "partial panel?"

3. Unless specific local instructions are in effect, in which direction shall aircraft circle an airport before landing?

(Answers on page 64)

"It's Spring . . . beware of the devil that drives a Dilbert!"

Operational Engineering

Aviation Fuel

AVIATION engines and their fuels are something like the proposition of the chicken and the egg . . . and which came first? Because one is so dependent on the other, it's hard to tell which is most important. You start with an idea for an engine and then you look for the fuel to power it. When you get the best fuel in best supply, you begin adapting the engine to use that fuel and after awhile the engine form becomes more complicated to get top performance out of the fuel which has also been improved to give best performance in the changed powerplant. Soon, well—which does come first?

As far as reciprocating engines are concerned, the fuel is a liquid containing potential energy in the form of heat which is turned into mechanical energy in the engine and this mechanical energy produces the thrust to propel an aircraft.

The simplest aircraft engines in widest use, those producing 65 to 250 horsepower, are installed in most personal and executive aircraft. All utilize aviation gasoline, a blend of hydrocarbon compounds which, when burned, release the greatest amount of energy for a given weight of fuel. To extract this potential by burning the fuel at its best output levels under various power demands, the engine must meter the supply of fuel and air to the cylinders to get the best ratios under varying conditions of altitude and speed.

Allowing the engine designers to worry along by themselves with problems of cylinder compression ratios, direct or gear drives, wet or dry sump lubrication and just where to place all the accessories, we come to the problem of where to place the fuel supply in the aircraft and how to get it from there to the engine at the proper time with the required volume and pressure.

A basic fuel system requires a fuel tank, a method of moving the fuel from the tank, with necessary lines and fittings and a fuel metering device to determine the fuel-air mixture ratios to be fed into the engine. The properties of the fuel determine the type of materials used in the system, the design of each component and the necessity for additional units to control and sustain a constant flow under all normal attitudes and temperature conditions. So that there's no misunderstanding about jets, diesels or experimental engines, every standard private aircraft flying today is powered by a four-stroke cycle internal-combustion engine with intake, compression, power and exhaust strokes in each cylinder. Aviation gasolines have been developed to get the most out of that type of power cycle.

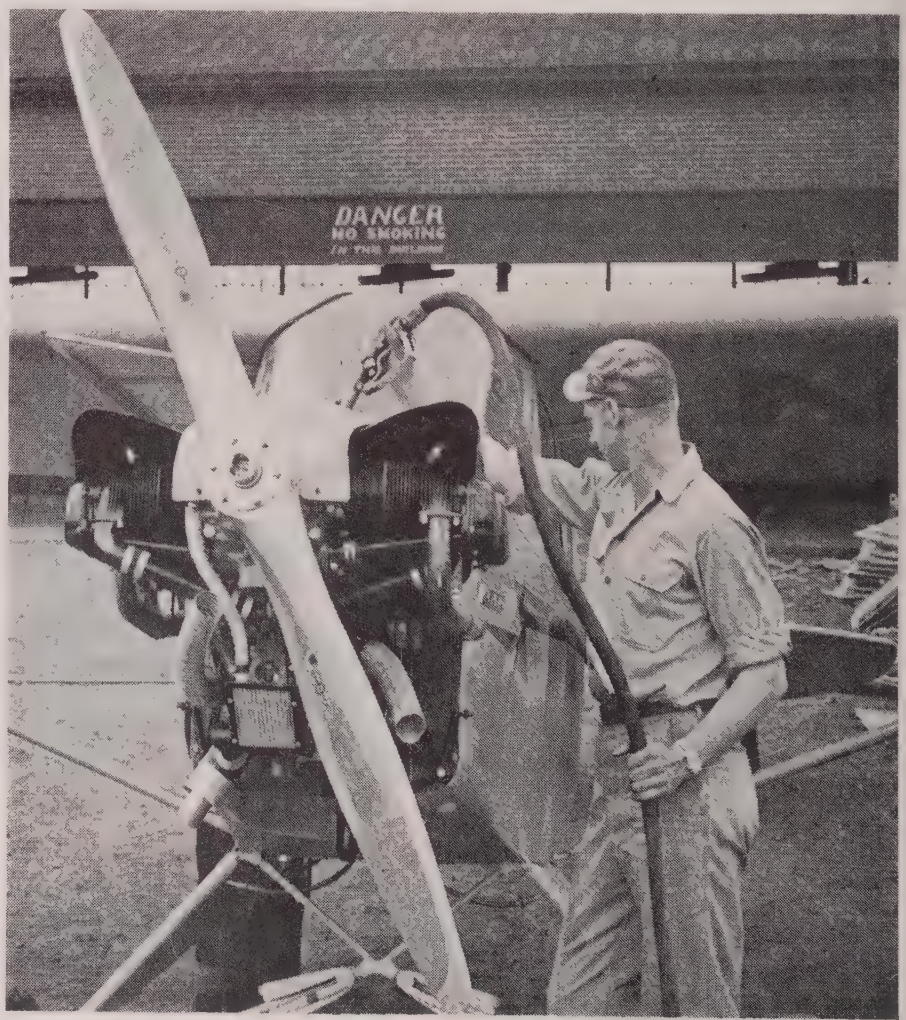
The five most important properties of aviation hydrocarbon fuels are: ease of evaporation in air (volatility), performance, grade or octane number (knock value), boiling in fuel lines (vapor locking tendency), resistance to various types of decomposition in storage (stability), and solvent or corrosion properties which involve chemical composition. Each affects the design and materials in the fuel supply and metering system.

The volatility of the fuel depends on the boiling point of the fuel, the amount of liquid surface exposed to the air and the temperature of the air; therefore, rapid evaporation is aided by high air temperature, separation of the fuel into fine drops and violent movement of the drops in the air in the engine intake system. If the rate of evaporation is too low and the fuel is not ready to burn in the cylinder when the spark arrives, then the fact that the fuel may have all the other properties is unimportant.

Knock value is usually expressed in octane numbers below 100 octane and in performance numbers above that level, derived from a knock performance comparison with combinations of iso-octane and heptane. When the grade includes two numbers such as 100/130, the first number is the knock rating at lean mixture and the second the rating at rich mixture. "Knocking" is the effect of uneven burning in a cylinder, either by preignition or unbalanced ignition, and a fuel of improper knock value may lead to burned or melted pistons and cylinder heads.

Vapor locking is due to the boiling of gasoline in any part of the fuel system (at about 140 degrees F. at sea level and at about 100 degrees F. at 20,000 feet for most aviation fuels) with the resultant delivery of fuel vapor with liquid gasoline to the carburetor, or it may cause the formation of vapor pockets in the system and block the delivery of the necessary volume of fuel to keep an engine operating even at minimum power. Vapor locking tendency and volatility are not the same and the greatest amount possible of the latter with as little as possible of the former is the desired norm. Volatility is important in the short passage of time (as little as one-sixteenth of a second) it takes the fuel to go from the carburetor to a cylinder; vapor locking may take place anywhere in the fuel system up to the carburetor and is usually brought about by high outside temperatures and air pockets

FUEL SYSTEM on standard Piper J-3 *Cub* is gravity feed. Advantages of this system are low cost, simplicity. Disadvantages are variation in metering, variable head of fuel



in the system or sharp bends which may swirl the fuel excessively.

If a fuel has the three preceding qualities at the proper levels—volatility, knock value and resistance to vapor lock—it is still not suitable if it loses any of the properties while in storage. The stability rating of a fuel depends on its maintaining its original properties despite evaporation losses over long periods of time.

The processes used in blending various hydrocarbons with the addition of special chemicals to get the best levels of the listed properties may result in the inclusion or formation of compounds harmful to various types of rubber or metal parts in the system. Thus the solvent and corrosion properties of the final fuel form must also be taken into consideration in determining its general suitability.

When the petroleum fuel engineers have achieved a final combination of hydrocarbons which will have the standard compromises of the important properties at the desired octane level, plus the additional value of not dissolving excessive quantities of water, it may be poured into a plane's fuel tank. Then we come back to the problem of adequate delivery to the engine.

While the basic system for a single-engine plane has been listed as involving a tank, lines, a delivery method and a fuel metering system, each demands certain refinements to handle the properties that have been included in the gasoline and also to properly supply the demands of the engine. Engineers of the Stromberg Aircraft Carburetor Division of Bendix Aviation Corp., in analyzing fuel systems and carburetors for personal aircraft, list the following basic requirements:

1. A fuel tank which is properly vented, leakproof and able to supply fuel under all normal operating attitudes of airplane operation.

2. A fuel strainer which will properly remove from the fuel any foreign material present which is of sufficient size to cause malfunctioning of the fuel metering and other components of the system.

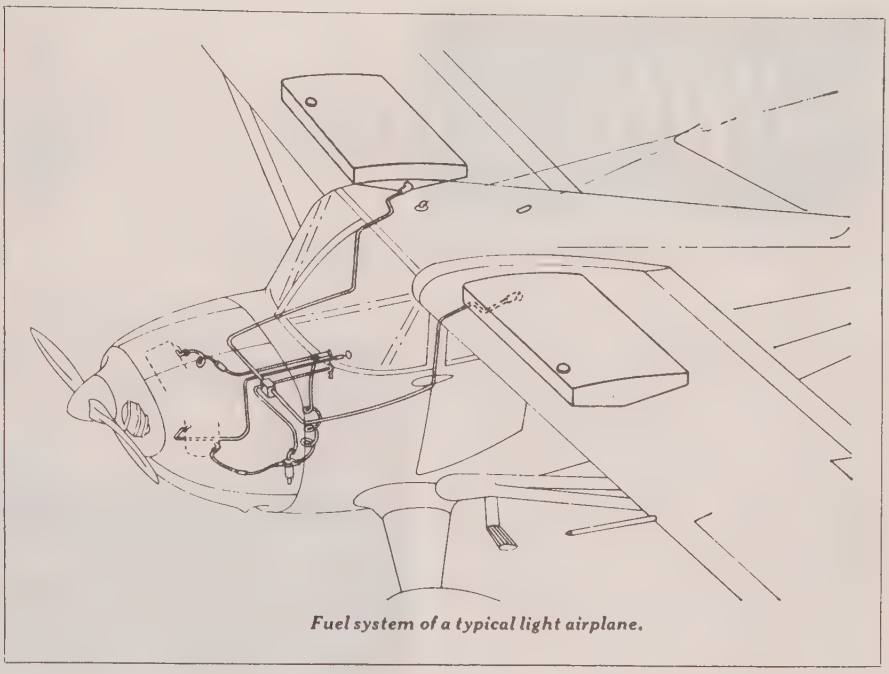
3. Where multiple tanks are used, a selector valve, with a low pressure drop and properly sealed to prevent the leakage of fuel from, or air into, the system.

4. An aircraft fuel line free of traps, and fuel-line fittings of sufficient size, designed for low turbulence, which when correctly installed are leakproof to fuel or the admission of air.

5. In the event there is not sufficient gravity head from the tank to meet the fuel-flow requirement, a fuel pump should be used which has sufficient dry lift and vapor-handling characteristics to supply the fuel metering unit with the required amount of fuel at the proper steady pressure.

6. A fuel metering device to supply the fuel required under each particular engine condition. The quantity may be limited on the lean side by the best economy mixture among other factors, and on the rich side the mixture ratio is limited by the fuel consumption of the powerplant in determining aircraft range. The metering device must supply fuel within a reasonable range of engine requirements and also must mix the fuel with the air in such a way that the fuel can be delivered to the individual cylinders in substantially equal quantities.

Other additions to the system would include a wobble pump to provide head pressure for starting and emergencies, and a separate primer to aid in starting if it is not incorporated in the carburetor system.



Fuel system of a typical light airplane.

The gravity feed system used on many planes under 125 horsepower is not suitable for highter performance because it usually meets only the minimum requirements for a fuel pressure of three psi at the float-type carburetor used. The addition of an engine-driven fuel pump in the system takes over the gravity feed at the point of its installation and assures regulated pressure under all conditions of operation. To eliminate vapor locking and to assure a supply of fuel to the engine-driven pump and also to act as a standby, a booster pump may be used at the fuel tank, but usually only in the pressure systems required for 125- to 200-hp.

The advantages of the gravity-feed system, according to the engineers, are simplicity and low cost; while the disadvantages include: a variable head of fuel, variation in fuel metering during maneuvers, limitations imposed upon airplane design to provide gravity feed from tank to carburetor, and limitations under vapor-forming conditions.

The advantages of a pressure-feed system with pumps and a metering device, which may be a float-type carburetor, pressure carburetor or a fuel injection set-up, include: a constant pressure supply regardless of airplane altitude or attitude within design limits and pressure unaffected by fuel tank head. A boost pump controls the vapor lock tendency and provides a greater latitude in metering device design. The higher cost of initial installation and cost of maintenance are the main disadvantages.

The complications of the fuel system have nothing to do with the grade of gasoline used in the engine. The proper gasoline is determined by the power requirements of the engine, both heat energy intake and mechanical energy output, and this may vary according to the rated engine speed, cylinder compression ratio, internal cylinder temperatures, manifold pressure and basic engine design for a particular job.

All of which merely brings the discussion back to the original point that engine design and fuel rating complement each other, and changes in one may require changes in the other. Changes in the fuel system are determined by the needs of the engine and aircraft and properties of the gas involved.

The power requirements and design of different types of internal combustion engines is pointed up by a comparison of aviation and automotive gasolines, which also demonstrates the danger of using automotive gasoline in an aircraft engine.

An automotive gasoline with a 73 octane number should compare in knock properties with grade 73 aviation fuel, but the lower volatility and higher vapor pressure of the automotive gasoline may cause knocking due to bad distribution or lean mixture resulting from vapor locking. Aircraft fuels are normally required to not exceed seven pounds Reid Vapor Pressure while winter grade motor gasoline may run as high as 12 pounds per square inch.

The chemical composition of the two types of gasoline also differ, with the aviation fuel composed largely of high heat energy paraffins, while the motor fuel includes large quantities of comparatively unstable olefin hydrocarbons which form only a small part of the aviation fuel. The higher gum content and the instability of the olefins in motor fuels tend to increase valve stem and cylinder deposits and may also result in general gumming throughout the system due to its instability if used regularly in an airplane.

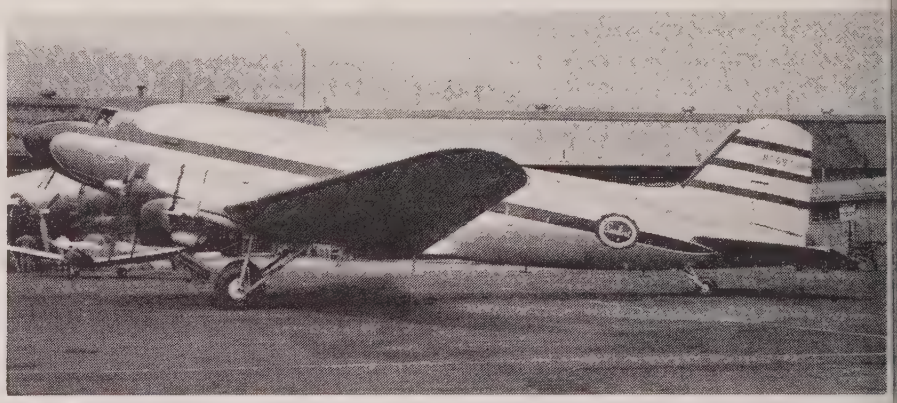
Each type has been compounded for the purposes of the engine it is used in, but conversely, improvements in the performance of either may result in power and design improvements in the engines.

Fuel for an aircraft engine must be suitable under a wide variety of operating conditions. There is no such thing as the perfect aircraft engine fuel since one that delivers 1,000 horsepower in one size engine may only deliver 500 horsepower in another (due to the difference in engine construction). While the fuel must be suited to the engine, the engine must also be suited to the fuel, the latter being a question of the type of fuel that is in greatest supply at a comparatively inexpensive manufacturing cost level for widest popular use.

CAOA REPORT . .

CORPORATION AIRCRAFT OWNERS ASSOCIATION, INC.

Corporation Aircraft Owners Association is a non-profit organization designed to promote the aviation interests of the member firms, to protect those interests from discriminating legislation by Federal, State or Municipal agencies, to enable corporation aircraft owners to be represented as a united front in all matters where organized action is necessary to bring about improvements in aircraft equipment and service, and to further the cause of safety and economy of operation. The CAOA headquarters are located at 444 Madison Avenue, New York 22, N. Y.



EXECUTIVE DC-3 is owned by National Dairy Products Company, Inc., New York. Chief pilot is W. R. "Rip" Strong. Fred F. Fritsch and J. P. Hellebrand are copilot-mechanics

Omni Sectional Charts

New charts featuring VOR and VHF navigational information printed in dark blue are now available for the northeastern, eastern and southern portions of the U. S. Others will be available shortly, and eventually the entire set will replace all sectional charts now in use.

This will be of special interest to many CAOA members who have installed any of the first class omni equipment in their aircraft, or who are thinking of doing so.

Twin Bonanza Performance

Although Beech Aircraft is wisely refraining from making any announcements until the figures on the new *Twin-Bonanza* Model 50 are fully proved by repeated tests under varying conditions, there is considerable interest in the results of the preliminary workouts. The original announcement indicated an estimated 180 mph over a range of 1,000 miles. We understand that the actual figure is around 190 mph at 6,000 feet. This sounds good for executive utility.

The Blue Book

CAOA's *Directory of Executive Aircraft* is getting around. We have asked several member company pilots to check on this for us. A number have reported that CAA communications personnel have the booklet right at hand and are using it. Director Cole Morrow of J. I. Case Co. says they constantly refer to it at the Milwaukee Control Tower.

A typical example is that of "Rip" Strong, recently back from a swing around the country with some executives of the National Dairy Products Co. Nearing Knoxville he called in the number of his DC-3, and got the reply, "OK, brother, we're looking right at you in the little blue book!" He received a somewhat similar reply in Greensboro and one other place.

Annual Meeting & Forum

Since the original announcements and questionnaires went out to CAOA members and other interested companies regarding the Association's annual meeting and third National Forum on May 18-19 at the Hotel Statler, Washington, plans for an outstanding event have gone steadily forward. Further details will be in your hands shortly.

New CAOA Members

Seven additional members have been added to our Association during the past few weeks. A sentence in the letter of application of one of them was both an encouragement and a challenge: "We believe that the association, properly operated, can greatly improve operating conditions for privately owned aircraft, and it is a pleasure to join your organization." A hearty welcome is extended to these new members, with the hope and expectation that they may take an active part in CAOA affairs.

Walker Manufacturing Company of Wisconsin (Racine), manufactures automotive equipment. For the past two years they have operated a Twin Beech. Bert R. Ellis is in charge of the operation and Harold Kaiser is company pilot.

Airtex Corporation of Spartanburg (S.C.) has operated a Beechcraft D-18S for busines service to the executives of two associate cotton mills—Spartan Mills and Arkwrigh Mills—since 1946. Ben J. Mangina is th pilot.

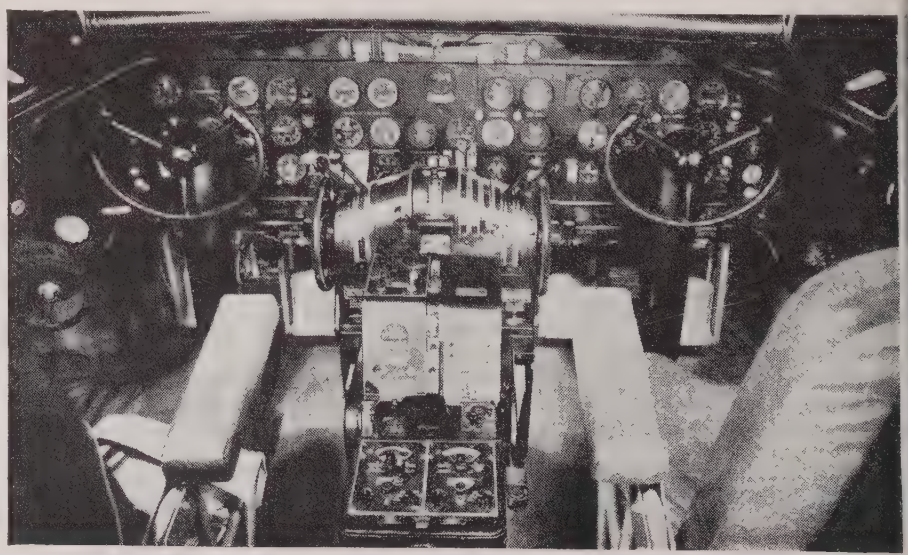
Consolidated Western Steel Corporation o Los Angeles are steel fabricators. The com pany operates a converted Lockheed PV- *Ventura* and a Twin Beech. Mr. Alden G Roach, president of the corporation (and o Columbia Steel) and Chief Pilot Roy H. Rollo will represent the company at CAOA meetings.

Ogden R. Reid (NY Herald Tribune) operates a Twin Beech and Grumman *Widgeon*, based at the Westchester County Airport. H. Lloyd Rondeau is the chief pilot.

The Tennessee Gas Transmission Company of Houston is engaged in the business of transmitting natural gas. It operates a Douglas B-23 converted bomber and two Douglas DC-3's; also a couple of Stinson *Voyagers;* chief pilot of this fleet is Anthony Zuma.

Young Radiator Company of Racine manufacture heat transfer products. This company operates a Beechcraft Model 35 *Bonanza.* The company will be represented at CAOA meetings by any or all of the following: Mr. F. M. Young, President; Mr. W. V. Astrup, Chief Engineer; and Mr. P. L. Berge, Pilot.

Sears, Roebuck & Co. operates a Douglas DC-3, handled by Air Traffic Div. of General Traffic Dept. Joe Favor is chief pilot.



FRONT OFFICE of *Convairliner* offers pilots comfort in riding as well as flying. Instrument panel is efficiently laid out. Many execs have expressed interest in *Convair*

Strike Fighter, F-90

(*Continued from page 15*)

fore I ever climbed into the cockpit than any a test pilot did 10 years ago after he'd ished all his flight tests. The factory spent er $600,000 on wind tunnel tests of this w configuration at Cal Tech and in a spe- l Lockheed factory wind tunnel. Then ey made up a series of minutely accurate ale models (about five feet long) that were opped from a P-38 at 35,000 feet and acked by radar. The models were made of eel and plastic for maximum weight and rried tiny radio sets which broadcast a ntinual record of the scale model's per- rmance. Even the control surfaces were tomatically actuated in flight to put the odels through pre-determined maneuvers high speeds.

By studying the records of these drop sts, the engineering department was able forecast about half the data normally pplied by dive tests in the completed air- ane. I flew the P-38 on a couple of these odel drop flights just to see how the proj- t worked out.

To give you an idea of how much work es into one of these fighter designs before e ship ever gets into the air, here's what ppened with the F-90. Late in August 45, the Air Force began an industry- sign competition for a penetration fighter. ie F-90 design was accepted by the Air ateriel Command in 1947 for further de- lopment and construction of a prototype. Roughly two years were spent in prelimi- ry design work. Sixty-five different con- urations—everything from the Delta wing almost no wing at all—were studied by e aerodynamic experts before the present edle-nosed, sweptback shape was settled in the spring of 1947.

By the middle of 1947, nearly 100 en- neers were assigned to design the airplane, nstruct a mock-up and build two prototype anes. I made the first flight with the F-90 June 1949, and the second prototype will flying by the time this article is in print. Even before the first flight, we ran exten- e taxi tests. I would take the brand-new 90 out on the eight-mile table-top expanse Muroc Dry Lake adjoining the Edwards r Force testing base and taxi it up to st short of the design take-off speed. Then check the stability. I could feel it— ase it—and then I'd lift the ship off the ound for just a few feet at a time.

Nearly 300 factory engineers and me- anics turned out to watch the first actual ght in the F-90. The most important thing me on this 37-minute hop was that the 90 ally liked to fly. No matter what other oblems you may encounter or what "bugs" main to be worked out, you're sure that u've got a good airplane that is going to liver the goods if it likes to fly.

Probably the most interested spectator on first flights was C. L. "Kelly" Johnson, ief Research Engineer for Lockheed. The 90 is his baby. I'm just the guy who oves in the air what he already has figured t on the drawing boards.

Even now when any rough tests come , I can look up in the concave rear-view rror and see Kelly Johnson coming along hind in a T-33 (two-place F-80) with ish" Salmon at the controls. It gives a test pilot a lot of added confidence in his designers when they will go along on the actual air work rather than just fly a slide-rule behind a desk. We use our own chase plane in all this test work so that there will be no delays waiting for pilots or planes. The T-33 is always available when we want to fly the F-90.

The F-90 differs in take-off and landing from the conventional jet fighter in its high angle of attack. With the extreme sweep-back of the wings, you really have to haul that nose up into the air to get the ship off the ground. On landings, it's the same thing all over again, but visibility from the "front office" is excellent.

The F-90 is a twin-jet job with two Westinghouse J-34 axial-flow engines that produce about 4,000 pounds of thrust each. As newer and more powerful engines are proven, they can easily be added to the F-90 because she's built with plenty of "beef." For present test purposes, we are using two or four RATO bottles on take-off, depending on the temperature of the drylake. (Now they're called RATO for *r*ocket-*a*ssisted *t*ake-*o*ff rather than JATO for jet assist.) A jet engine is about three times as sensitive to temperature changes as a reciprocating unit. A conventional engine drops about 1 per cent of power for each 10° temperature rise above normal while a gas turbine will drop about 4 per cent. On the other end of the scale, a jet is increasingly more efficient at cooler temperatures.

These RATO bottles last for 12 seconds so I usually wait until I have just about take-off speed—let's use a hundred miles per hour for a nice round hypothetical figure—and then hit the trigger on the RATO. Then I pull off the ground, up the gear and have 200 mph before the RATO's poop out.

When it comes to instruments, the F-90 is really loaded. There are more instruments for the pilot to watch than on the Navy's big 185,000-pound four-engined *Constitution*. On the big ship, there's a flight engineer to take care of all the engine instruments. In the F-90, they're all yours. There are over 200 circuit breakers in the cockpit, but I can give them a careful once-over in not much over one minute. All the engine instruments are in a vertical panel on the right-hand side of the cockpit, with left- and right-engine instruments beside each other. Naturally, much of our instrumentation is for experimental test work. A production job would have fewer instruments and more tactical equipment.

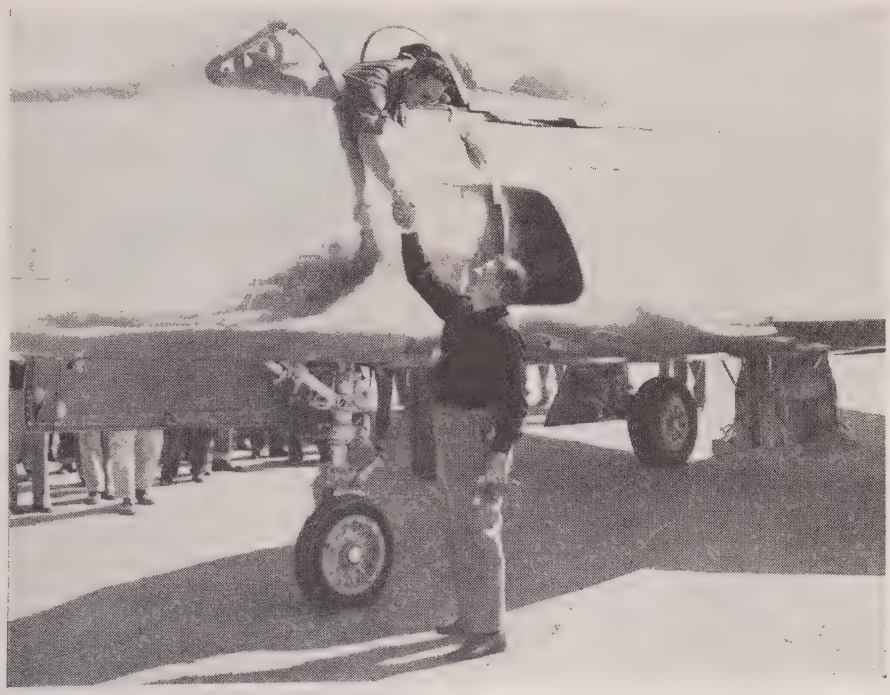
On the subject of instruments, we are taking turns flying our shuttle DC-3 under the hood whenever we don't have a load of passengers. We even make take-offs from the drylake with the hood down. The ship has an ILS approach system installed and we plan to make simulated instrument approaches at the Los Angeles International Airport using both ILS and the newly installed GCA system. What we learn from this work can very well be valuable in fighter installations. After all, they're made to operate in all kinds of weather, day or night.

There isn't much in the way of clouds at the altitudes where the jets fly and so far I've never been bothered with any icing. There is less chance for a fast plane like the F-90 to ice up because you pass through the icing level in such a short time. I don't recall that any of the test pilots at Edwards Field have yet iced up in a jet. The adiabatic rise of temperature due to impact doesn't tend to make ice stick to a fast plane, and once you're through the icing level, the sun will burn off any small amount of ice that sticks to the airplane.

Naturally, the cockpit is pressurized for these high-altitude flights.

You have two top limits to watch on a jet airplane—maximum rpm and maximum tail-pipe temperature. Naturally, you get peak power when both temperature and rpm are at their highest allowable output. If either gets too high, you're in danger of damaging the powerplant. The conventional throttle

(*Continued on page 43*)



TEST PILOT Tony LeVier gets a "good flight" handshake from Lockheed's Chief Research Engineer, C. L. "Kelly" Johnson. The fabulous Lockheed F-90 is "Kelly" Johnson's baby

C.A.P. News from Hq.

Reorganization
Savannah, Georgia: The local Civil Air Patrol is getting ahead by leaps and bounds since its rather recent reorganization. In the CAP hangar are two Stearmans, an L-4, three Link trainers, and a 45-watt shortwave wireless outfit complete with walkie-talkie units and a field telephone. When a Savannah automobile dealer heard that the unit had no place to meet, he came to the fore and gave CAP space in his show room. The Savannah unit will hold their meetings there until they locate a building of their own.

CAP Air-Rescue
Los Angeles, California: Search for a civilian Culver *Cadet*, missing on a VFR flight from Glendale, California, to Hamilton Air Force Base, was climaxed when CAP pilot Frank Anderson sighted the crashed plane in the Topatopa Mountains northwest of Los Angeles. Pilot Anderson was flying a twin-engine Cessna. News of Anderson's discovery was radioed to the AFB, and a Pararescue team from Flight A, 4th Rescue Service of the Air Force was dispatched to the scene. The Pararescue team jumped in to find the pilot missing. Evidence showed he'd been injured. He was located the next day in fair condition several miles southeast of the crash site.

New Supply Chief
Washington, D. C.: Lt. Col. Frank P. Smith has been appointed Supply Chief to replace Lt. Col. John B. Pattison, Jr., who has been assigned to Afghanistan as air aide to the U. S. Military Mission. Lt. Col. Smith flew the Berlin Airlift in 1948 after serving 26 months as Air Inspector and then Director of Supply and Maintenance at Templehof Airdrome in Berlin. For two months, Col. Smith was C.O. of the 61st Maintenance and Supply Group at Rhein-Main, Germany. He is a graduate of the Air Command and Staff School.

Personnel Changes
Hqs. Bolling Field: In New Mexico, Col. Kilbourne L. House has resigned as Wing Commander and has been replaced by Acting WC Lt. Col. H. E. Livingston. In Iowa, Col. W. O. Fuller has resigned and has been replaced by Major H. E. McKinney. In Utah, Col. Jos. S. Bergin has resigned and been replaced by Major Ralph E. Winn.

Mercy Mission
Albuquerque, N. Mexico: Thanks to the efforts of Lt. Col. Howard E. Livingston of the New Mexico Wing, CAP, and Capt. J. Bridges, CAP liaison officer, urgently needed blood plasma was rushed to Roswell, New Mexico, where a 15-year-old patient lay in critical condition in St. Mary's Hospital. The blood plasma was delivered to Kirtland Air Force Base and was flown by Lt. Henry W. Frazier in an F-86 *Sabre* to Walker Air Force Base in Roswell in just 22 minutes. Airline distance between Kirtland and Walker is 175 miles. Arrangements for the flight were made by the CAP's Col. Livingston and Capt. Bridges.

Test Program
Indianapolis, Indiana: Two test programs of CAP cadet training in high schools are now being conducted in Indiana. If the project is successful, high-school cadet training will be offered in all Indiana high schools.

CAP Flyers Honored
Scottsbluff, Iowa: Members of the Civil Air Patrol who took part in "Operations Snowbound" during the blizzard of '49 were honored in ceremonies at Scottsbluff, Iowa, recently.

Topping the list of CAP flyers taking part in the rescue work were Warrant Officer John Huff and Wm. O'Brien, both of Alliance, Iowa, who lost their lives in "Operation Snowbound" activities. They were posthumously awarded the Distinguished Service
Also receiving the DS medal were Maj
Brennan of Mitchell; Capt. J. L. Le
Bayard; and Capt. Wm. Ostenberg
Scottsbluff.

An Exceptional Service award was
to W. O. Virgil F. Plummer of Bayar
Meritorious service awards were made
Robt. K. Knox, Lt. E. L. Haxby, C. Flie
K. E. Smith, E. W. Sievers, E. Me
Barfoot, F. Clark, Wm. R. Fran
Schmunk, J. Stacken, L. Anderson, R. U
D. Pearson, W. Kramer and Gene Cha
of Scottsbluff; R. Schumacher of Mi
D. Boyer, J. Butcher, Wm. Grant, S
and V. Munger of Alliance; and S. L
E. L. Norman of Chadron.

CAP Loses Member
Fort Peck, Montana: Lt. Emil Kuel
member of the Fort Peck CAP, cras
his death recently when he becam
on a flight between Fort Peck and
City. A CAP search was instigated
diately and Lt. Kuebler's crashed pla
located shortly after the weather lifte
ciently to permit wide-spread aerial
naissance. Donald Burns and Bill D
spotted the downed aircraft. Lt. Kuebl
one of the most popular members of th
Peck Squadron, and was the father of
Kuebler, who was chosen as Montana
standing CAP cadet last spring.

Glider Wings
Hqs. Washington, D. C.: Civil Air
glider pilot wings are available for qu
members. The wings are similar in
to the CAP pilot and observer badg
have a distinctive "G" in the center. E
ity to wear the glider wings is set fo
CAP Regulation 50-1.

CIVIL AIR PATROL arranged F-86 flight from Albuquerque to Roswell with needed
plasma. Lt. Col. Livingston of CAP is shown here handing plasma to F-86 pilot Lt.

trike Fighter, F-90

(*Continued from page 41*)

care of the rpm's while the jet temure is regulated by changing the size ie opening in the jet-exhaust system. can cool down the engine by increashe size of the exhaust, but naturally it s a slight loss in power.

each test flight at the Edwards Air Base, we have a pre-flight and postconference with the engineers. I have ewritten list of maneuvers that I'm to rm and usually a list of special charistics to watch for.

re's an example of a recent typical test . The take-off is a part of every test. try to change the conditions of each off after the first few flights to experi- with different speeds, power settings, On this particular flight the engineers ed a one "g" stall at 15,000 feet. After they wanted a "VG" (velocity-"g") out at a certain load factor to observe buffeting characteristics. This particuest was for a maximum "g" loading at mph.

le next part of the test included "VG" uts at x speed.

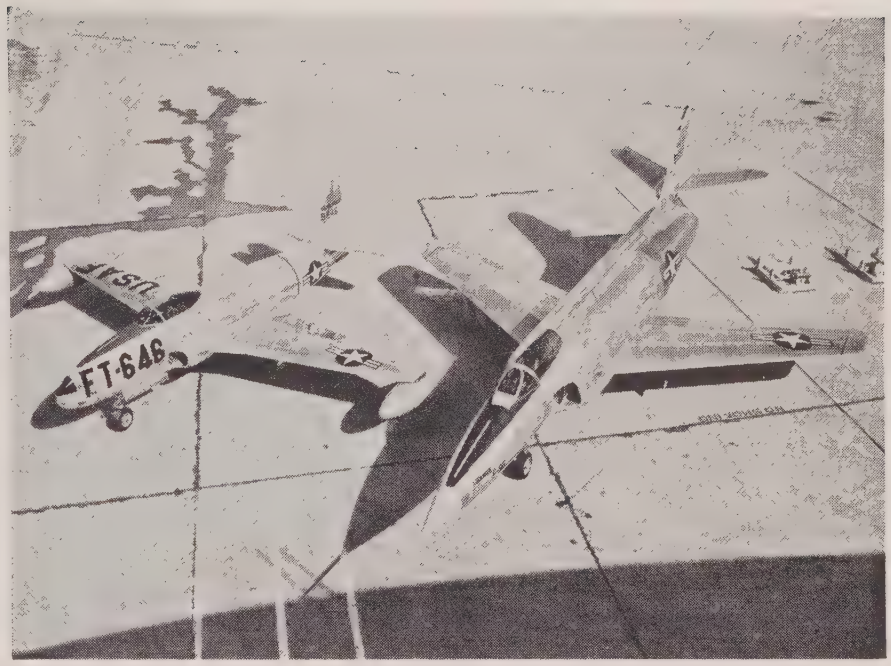
ter that there was a dive to x speed to k for "snaking," that's a tendency that anes with sweptback wings have to yaw side to side with a certain frequency. omething like a kid's metronome, only r. The Boeing XB-47, for instance, gets from this "snaking" tendency with a in automatic pilot that is designed to teract the pressures as they begin.

ere are several ways of recording the ts of these tests. Years ago I used a pad and a pencil, but there's just too to watch in these big airplanes. We to use a two-way radio with the Eds control tower, but anyone who had a receiver could listen to what I was g the engineers—and that wasn't so security-wise. Now we use a wire der that is turned on before I leave the nd. It records everything that I say I'm in the air as well as any ground uctions that come through my radio.

have a photo-recorder with 16-mm that shoots a special instrument panel, rally located in the nose of the ship. engineers have this special panel comly loaded with all the instruments it hold. Depending on the type of tests re running, we shoot 400 feet of film frame every five seconds and on up to ames per second.

spite of what you may have read about flying, we don't use a lot of gadgets aren't necessary. I never use a pres-ed "g" suit unless I'm going to make nged high-speed pull-outs. I'm in pretty physical shape, and I don't black out s I hold 5 or more "g's" over quite a period of time. I do use a Lombard helmet, but I don't like it too well. doesn't fit quite right and there's no lation in it. Out on the hot desert you ire freely and that hard helmet is unortable, but it is a good safety pre-on since those air bumps at high speed be plenty solid, and in case of a bail- would protect your head.

ke all the rest of the pilots at Lockheed, ve my own parachute and the factory



LOCKHEED began its jet line of military air craft with the well-known F-80 *Shooting Star (left)*. The fast F-90 is Lockheed's most recent addition to the military production line

'chute specialist repacks it every month.

The first flight in the F-90 was merely a climb to a safe altitude followed by a check of the stability and control characteristics of the plane. I had to be sure that the ship behaved normally in a clean configuration and then with the gear and flaps extended. There wasn't any high speed on the first flight. That came later.

Every plane ever built has a critical mach number. That holds true as well for rockets and projectiles. However, the rockets have sufficient power to pass through this critical speed quickly and then continue on in fairly smooth operation.

Because of the series of unknown quantities in this high-speed test work, the F-90—like all other modern fighter aircraft—has an ejection seat. If I want to get out of the airplane in a hurry, there are only three operations. I pull up on two handles mounted on each side of the pilot's seat. That lowers the seat to the bottom and ejects the cockpit canopy. Then I put my elbows on a little ledge on each side of the seat and my feet on a pair of pedals similar to those on a wheelchair. The handles have grips like an automobile handbrake. When I squeeze those handle triggers, the seat and I shoot upward and away from the plane as though we were shot from a cannon. I can then leisurely unhook myself from the seat and pop my 'chute.

Both the engineers and I have more experience on this ship than anything that has come before it. The more experienced the pilot, the more information he can get from each flight. Eleven years ago, when I got into the business, test flying was sort of a devil-may-care, glamorous business for pilots with more nerve than brains. Today, it is just as much a science as any precise, well-planned operation. There isn't any more the "will-it-fly" type of test work. We know it will fly before we ever build it. We know just about how fast it will go, how far and with how much load. We know the take-off speed, landing speed and rate-of-climb with a pre-determined amount of thrust before the ship has ever been in the air. You'd be surprised just how accurately these preflight figures actually work out.

After all the test work on the F-90 to date, we have made only a few changes in the airplane. There are always minor fillet changes and mechanical modifications in the controls, etc., but they amount to only a drop in the bucket when you figure out just how complicated one of these new airplanes can be.

We have even gone back to the old-fashioned tuft testing to find out where the burbles are along the skin of the F-90. In the old days this used to be the accepted method of finding out just which way the airflow went around a wing, tail or fuselage. Today, we put pieces of nylon twine on various sections of the ship with Scotch tape and a special applicator. Then we take the ship up and fly it. Where the tufts are either blown away or badly frayed, we know there's excessive separation or turbulence. Then the engineers figure out how to eliminate it.

Naturally the actual results on this F-90 are classified for security reasons, but here's an example on the P-38 to show how a test pilot can help make a better airplane. I stumbled across this little imperfection while I was in England doing demonstration and test work for the Air Force.

The P-38 had a wing fillet at the center section right by the seat with a rather long span without any interior support. We had been having a little trouble even at low "g" loadings with buffeting that shouldn't have been there. One day I feathered an engine for a demonstration and the ship started to buffet at 160 mph. That wasn't normal so I stopped the demonstration. That night I talked the whole thing over with of our engineers and decided that it might be "span flow" with air seeping out through the gap between the fillet and wing, causing separation and turbulence with resultant loss of life, and buffeting. This disturbance affected the tail, too.

(*Continued on page 59*)

New Beech Bonanza

(Continued from page 20)

was King Williams, Manager of the Monrovia Airport. We carried full gas tanks—19½ gallons in each wing—and about 30 pounds of photo equipment in the baggage compartment. This compartment is accessible in flight and will hold up to 270 pounds. The new zipper entrance to the baggage space provides a hat-rack when the cloth covershelf is closed.

The *Bonanza* has a neat gas-selector valve and wobble pump all in one unit. Before starting the engine, you turn the selector handle—located just below the pilot's left knee—to one tank or the other and then pull up and use this handle as a wobble pump. Then you turn on the switches, use the wobble pump to pick up a little fuel pressure, touch the starter button and your engine is going.

A pre-take-off check includes the usual magneto and carburetor heat once-over, an inspection of flap action, propeller-pitch change, trim-tab setting and a final check for control freedom. With the new fully-automatic variable-pitch propeller, the accepted procedure is to run the prop down from the 1500 to about 1300 rpm with the manual decrease switch. Then return the switch to "constant speed" and when the rpm's pick up to the original 1500, you know that both circuits are operating.

The *Bonanza* has most of the accessories found on large transport planes and for the first couple of flights, a new pilot can be a busy little beaver. However, there is nothing in the *Bonanza's* cockpit to cause any headaches once a pilot has become familiar with the location and use of the gages and gadgets.

Since the Monrovia Airport is paved for only the first 500 feet, we dropped 10° of flap—the short-field take-off recommendation—and poured on full throttle.

"Start back on the control column after you pass the 50-mph mark," advised Mr. Larson while the ship was picking up speed.

As we rolled off the paved portion of the runway, the control wheel came back. The red stall-warning light flickered briefly and the *Bonanza* hopped into the air. There is no horn on the stall-warning indicator because the landing gear is equipped with a warning horn.

The *Bonanza* required a surprising amount of right rudder to counteract the engine torque. Once we were definitely in the air, we reached over to the right side of the panel, flicked the safety lock out of the way and snapped up on the gear lever. The added gear-up speed is clearly noticeable from the first take-off.

"Leave the throttle wide open for a thousand feet," advised Mr. Larson as we reached down to back-off on the power. "You can come back on the prop to 2,050 rpm anytime now. This engine has an enriching jet in the carburetor so that extra fuel goes into the engine at full throttle. Actually, you cool the engine with extra gasoline at full throttle."

With the gear up, we accelerated rapidly to a normal climbing speed of 100 to 110 mph. Our rate-of-climb indicated just over 800 fpm. There was no decrease in rate of climb as we snapped up on the flap switch and our one-third flap retracted. We pulled back to 25 inches of manifold pressure with the smooth-acting vernier throttle control and turned out of the traffic pattern.

BEECH beside the beach. . . . this photo was taken at end of George Hammond's pint-sized airport. Note fence which was torn down to provide a "sub-zero" approach to landing strip

The weather was rather cold for Southern California and we climbed up through the "smog" layer that lay trapped over Los Angeles by a temperature inversion. As we headed west toward the ocean, we turned on the RCA VHF radio—also standard equipment—and checked with Burbank Radio for the latest Santa Barbara weather. While using VHF transmission, this radio unit has a standard low-frequency receiver. A spiral non-kinking mike cord is a new handy gadget and a radio call-number tab is mounted directly above the receiver so that the pilot need not check the numerals atop his right wing before giving the airplane's call sign. It's just a little thing, but it adds to the completeness of this airplane.

Standard radio equipment also includes a marker-beacon receiver and an aural-null loop with a 360° needle on the instrument panel just above the radio.

Research has proved that noise is one of the greatest contributors to pilot fatigue. Beech engineers have done an outstanding job of soundproofing the new *Bonanza* so that pilot and passengers may talk in a normal voice. The longer the trip, the more a pilot will appreciate this quiet, comfortable cabin.

We had hardly enough time to get the feel of the smooth controls and partially memorize the instrument panel before we were over Ventura. We plowed through a little choppy air and Mr. Larson explained that the new trim-tab with an inverted airfoil section dampens yaw and makes the *Bonanza* easier to fly hands-off in rough air.

"Many people don't know it, but the later model *Bonanzas*—beginning with #1501—are 17 pounds heavier in empty weight than the original ship, because added 'beef' to the extent of 26 pounds has gone into heavier skin, bulkheads and center section. The design load factor is now 4.4 and the yield factor is 6.6."

We called the Goleta tower from over Ventura—35 miles out—and received immediate landing clearance. By merely rolling forward on the trim tab, the *Bonanza* picked up speed on a long downhill run to the airport. With the new constant-speed propeller, the rpm did not increase even though we picked up 30 mph in airspeed.

Beechcraft guarantees an average of 19.4 miles per gallon, plus or minus 3 per cent, so long as proper power settings are used and no additional drag features (such as an ADF loop) have been added to the outside of the airplane.

Over downtown Santa Barbara we slowed up to 125 mph and dropped the gear. Older models had the gear "red-lined" at 105 mph. The gear came down quickly and we checked the green light on the instrument panel, the red indicator needle between the sets of rudder pedals and closed the throttle briefly to make sure that the warning horn did not blow.

We still had 2500 feet so we slowed up the *Bonanza* to check the stall characteristics. There is a noticeable control shudder just after the red stall-warning light comes on—between 55 and 60 mph—that even the most inexperienced pilot could recognize.

We circled the former Marine base at Goleta and deliberately came in on a final approach that would normally be too high for a *Bonanza*. We had an even 1,000 feet as we turned in on the final approach and hit full flaps. The flaps came down quickly and we would have undershot the field if we hadn't added a little throttle. The new flaps are a great improvement.

"Can you drag the tail skid with this load?" we asked Mr. Larson as the *Bonanza* came across the end of the airport.

"I doubt it, but go ahead and try if you want to," he replied.

We came back on the control column and held the ship just off the runway as long as possible. The red stall light blinked briefly and the ship settled into the runway on its wheels. With full back elevator and one passenger in the back seat, the tail will not drag.

Taxiing over the broad runways at Goleta

(Continued on page 46)

SAVE! BY MAIL!

KLEIN'S

CHICAGO 6, ILLINOIS

CREDIT—CASH—TRADE

Savings in Sports

- LOWEST PRICES
- MONEY-BACK GUARANTEE
- FAST, DEPENDABLE SERVICE

SINCE 1885

RUGER 22 AUTO

$37.50

For the shooter who must have the best! 10 shot, 22 Long Rifle, 4¾" Barrel, blued. Weight 36 oz. Complete price new is $37.50. (Add $4.95 for hand carved holster for any Handgun listed).

$7.95 **2 Pc. RAIN SUIT**

Special Purchase! 100% Waterproof 2 pc. STORM SUIT, sells for $12.00 Everywhere! Parka Hooded Jacket, snap fasteners, 2 roomy flap pockets, plus trousers to match, made from tough olive drab Vinylite Plastic. Brand new! Snag Resistant. Won't stiffen or crack. State choice of small, medium or Large. Both, only.....$7.95

GLASS ROD & REEL

$9.95

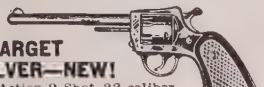
Only Klein's offers the new "Southwester" 4½ or 5 ft. Solid Glass Fiber Rod with Pistol Grip offset handle and hardened steel guides, plus the Klein's Deluxe $11.00 Value Level-wind Reel, Anti-backlash, both for only $9.95. An actual $18.95 Value!

MARLIN 39A

$52.30

New 1950 Model 39A Marlin lever action 22 caliber Rifle. Shoots 22 Short, 20 Long, or 18 Long Rifle ctgs. 24" Barrel, Takedown. Walnut stock. Amazingly Low Priced. Limited quantity $52.30

H & R "922 TARGET REVOLVER—NEW!

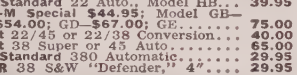


Double Action 9 Shot, 22 caliber, newly redesigned. The "922" is recognized as the Country's leading revolver for value and performance. Shoots all 22 cartridges, regular or high speed. State choice of 6", 4", or 2½" barrel length. Blued Finish. (Add $2.00 if Chrome Finish is wanted.) Weight, 24 oz. **Amazing Value, only.....$24.75**
Also available: The new Iver Johnson Sealed Eight 22 Revolver—8 shot—6 inch barrel $20.40

NEW HANDGUNS

Smith & Wesson K22, K32 or K38.....$65.00
S&W M&P 38 Spcl. 2" 4, 5 or 6" 56.50
S&W 32 Hand-Ejector 3½" or 2" .. 51.25
S&W 38/44 Heavy Duty 4 or 5" .. 64.00
Colt 22 or 38 O. M. Target Special. 75.00
Colt Official Police 38 or 22 cal.... 65.00
Colt Woodsman 4½"—$60.00; 6"—$70.00; M.T. 4½ or 6" 85.00
H&R 922 Target Revolver, 22 cal.. 24.75
Iver Johnson 22 Target Revolver... 20.40
H&R "Sportsman," Revolver, 22 cal. 44.95
Iver Johnson 22 Super Shot..... 37.75
Hi Standard 22 Auto., Model HB... 39.95
HD-M Special $44.95; Model GB—$54.00; GD—$67.00; GE..... 75.00
Colt 22/45 or 22/38 Conversion... 40.00
Colt 38 Super or 45 Auto. 85.00
Hi Standard 380 Automatic..... 29.95
H&R 38 S&W "Defender," 4".... 29.95

NEW SHOTGUNS

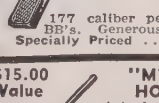


Browning Belgian Auto. 12 or 16 Ga.$108.80
Browning Belgian Auto., Light Wgt. 124.50
Browning Over-Under, Rib, 12 or 20 Ga. 219.00
Browning Over-Under, Vent. Rib.. 244.00
Marlin M. 90 Over-Under, all Ga.. 82.45
Stevens 22 /410 Over-Under..... 32.95
Remington Streamlined Automatic.. 99.95
Remington New 870 Pump, 12 Ga. 69.95
Rem. 31 or Winch. 12 Pump, all ga. 84.95
Remington new model 870 pump.. 69.95
Ithaca 37 Pump 16, 20 Ga.... 78.93
Ithaca 37R Pump Raised Rib.... 94.64
Winchester 42–410–3" Shell Pump 73.95
L. C. Smith "Olympic" 12/32" Spl. Trap 158.30
Winchester 24 Double, all Ga..... 68.95
L. C. Smith Double, all Ga..... 98.95
Mossberg 185D—20 Ga. Repeater.. 22.95
Mossberg 183D—410 Repeater.... 20.55
Mossberg 185K 20 Ga. Repeater.. 26.95

NEW RIFLES

Remington 722-222 caliber .....$ 77.95
Winchester 70 Super—All Calibers. 162.50
Winchester 63 Automatic 22..... 63.50
Remington 241 Automatic 22..... 63.50
Remington 550 Automatic 22..... 34.95
Winchester 74 Automatic 22..... 33.95
Marlin 30/30 Model 336SC..... 61.45
Marlin 30/30 Model 336A..... 72.55
FN Mauser DeLuxe Sporter, all cal. 164.50
FI Mauser Sporter, all calibers.... 135.00
Winchester 94, 30/30, 32 Special... 62.45
Winchester 43, 22 Hornet, 25/20. 54.95
Winchester 70—All calibers..... 109.50
Remington 721—30/06 or 270... 79.95
Remington 722—300 or 257..... 74.95
Remington 141A–35 cal.–$104.95; 81A–300 caliber 129.95
Savage 99EG 250/3000 or 300.... 96.45

MARKSMAN AIR PISTOL $4.95



NEW MODEL!

Looks and Feels like U.S. Army 45 Auto. Accurate and Powerful. Shoots 177 caliber pellets, darts, and BB's. Generous supply included. Specially Priced $4.95

$15.00 Value — "M" MODEL HOWITZER $5.95

Actual scale model of the famous "Bofors Anti-Aircraft Howitzer Cannon." Made to sell at $15.00 — limited quantity — only $5.95 at Klein's. **Features: pneumatic recoil action, geared windage and elevation adjustments, shoots steel ball (package of shot included) for 30 feet, made with amazing precision of brass, bronze and aluminum.** Size 9" x 4" x 4". Makes beautiful desk ornament or lead soldier annihilator. At Klein's Exclusively, only $5.95

Weber $25.00 FLY CASTING COMPLETE OUTFIT $21.95

23 pieces. All made by Weber, long famous for fly tackle. Contents: Weber 8½ ft. 3 piece split bamboo fly rod with extra tip; Weber Single Action Fly Reel (add $3.95 if South Bend Automatic Fly Reel is wanted); fly line; 3 leaders; 12 Fly Lures; Fly Box; Rod Case, Compound; leader pouch, etc. State choice of Bass or Trout Model Outfit, all for only.....$21.95

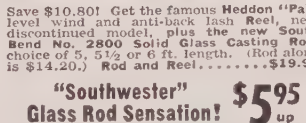
AIREX SPINNING OUTFIT FOR BAIT CASTERS $11.95

Outfit contains the new Airex "Vic" Spinning Reel, 100 yds. of Airex Spinning Line and an Airex Conversion Handle and Guide. Used with your favorite bait-casting rod and your favorite lures from ¼ to ¾ oz., you bait casters will be well equipped to enjoy the advantages of Spinning. Complete outfit, only $11.95

Heddon "Pal" Reel and South Bend Glass Rod, both only $19.95

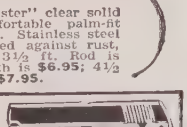
Save $10.80! Get the famous Heddon "Pal" level wind and anti-back lash Reel, now discontinued model, plus the new South Bend No. 2800 Solid Glass Casting Rod, choice of 5, 5½ or 6 ft. length. (Rod alone is $14.20.) Rod and Reel.....$19.95

"Southwester" Glass Rod Sensation! $5.95 up



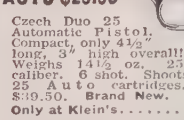
Famous "Southwester" clear solid fiber-glass. Comfortable palm-fit pistol grip handle. Stainless steel guides, guaranteed against rust, rot, and "set." 3½ ft. Rod is $5.95; 4 ft. length is $6.95; 4½ or 5 ft. length is $7.95.

DUO 25 AUTO $29.95



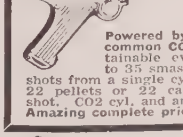
Czech Duo 25 Automatic Pistol. Compact, only 4½" long, 3" high overall! Weighs 14½ oz. 25 caliber, 6 shot. Shoots inexpensive 25 Auto cartridges. Regularly $39.50. Brand New. Only at Klein's.....$29.95

NEW! Schimel Gas Gun



Powered by gas from any common CO2 cylinder, obtainable everywhere. 30 to 35 smashing 22 caliber shots from a single cylinder. Shoots 22 pellets or 22 caliber lead ball shot. CO2 cyl. and ammunition incl. Amazing complete price is...$20.00

BARGAIN!



Save more than 50% on these famous new Webley Air Target Pistols. Made in England. World's finest and most powerful pneumatic air gun!
177 caliber, was $22.00. Now $9.95

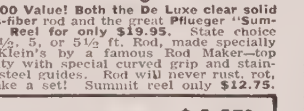
TRADE GUNS!

We want to TRADE GUNS with you. Write Milt Klein about your gun(s) in detail. Advise amount you want in CASH or TRADE. Remember that used guns do not bring new prices, and that we must make a fair profit on the resale of your merchandise. WRITE TODAY!

FLY RODS—40% OFF!

Special Purchase! Perfect quality new tonkin cane bamboo fly rods at 40% off. When you see the rod you'll recognize the world's finest rodmaker's workmanship—money-back guarantee! State choice of 8½ or 9 ft. length, bass or trout action. Sturdy case and extra tip included with each rod. $25.00 Quality, now $14.95; $30.00 Quality, now $17.95; $35.00 Quality, now $19.95; $40.00 Quality, now...$23.95
Shakespeare Auto. Fly Reel, only... 5.45

PFLUEGER REEL & GLASS ROD $19.95



$30.00 Value! Both the De Luxe clear solid glass-fiber rod and the great Pflueger "Summit" Reel for only $19.95. State choice of 4½, 5, or 5½ ft. Rod, made specially for Klein's by a famous Rod Maker—top quality with special curved grip and stainless steel guides. Rod will never rust, rot, or take a set! Summit reel only $12.75.

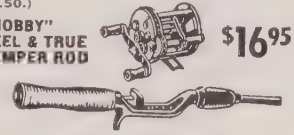
"Supreme" Reel & Heddon Rod $44.70

Save $12.80 on these two great new items! The balanced combination of the Heddon "De Luxe Pal" Rod and Pflueger "Supreme" Reel cannot be equaled! The Rod is 5 ft. 3 or 4 inch length—discontinued length—fresh stock—finest tubular steel—stainless steel guides—checkered walnut forward grip. Supreme Reel alone is $32.95.

"AKRON" REEL & "GEP" ROD $13.39

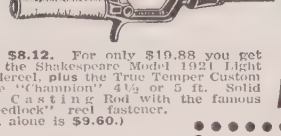
Balanced! Another Klein's exclusive! The famous pistol grip "Gep" Actionized solid steel casting Rod, choice of 4½, 5 or 5½ ft. length, discontinued Model 555, $9.45 value, plus the new 1950 Model Pflueger "Akron" level wind and anti-backlash Reel both for only $13.39. (Akron Reel alone is $8.50.)

"NOBBY" REEL & TRUE TEMPER ROD $16.95



True Temper "Challenger" Model 500 tubular steel 4½, 5 or 5½ ft. casting rod, plus the great new 1950 Pflueger "Nobby" level wind and anti-backlash reel. Both for $16.95. (Reel alone is $9.75.)

"WONDEREEL" & TRUE TEMPER ROD $19.88



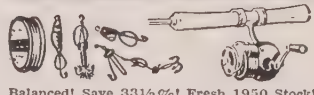
Save $8.12. For only $19.88 you get both the Shakespeare Model 1921 Light Wondereel, plus the True Temper Custom Grade "Champion" 4½ or 5 ft. Solid Steel Casting Rod with the famous "Speedlock" reel fastener. (Reel alone is $9.60.)

FREE CATALOG

Klein's Big Bargain Sports Catalog FREE WITH ANY ORDER FROM THIS AD, or send 25c for catalog only. Gift Included!

Dealers: Write for Quantity Prices

$30 Spinning Outfit $19.95

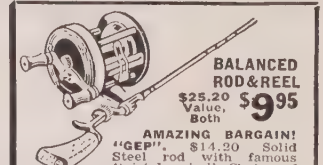


Balanced! Save 33⅓%! Fresh 1950 Stock! Complete outfit contains: Airex "Spinster" Bache Brown Reel, Montague 6¾ ft. two-piece Split Bamboo Rod, 100 yds. Nylon Spinning Line, 4 Bache Brown Spinning Lures, Instruction Booklet. Worth $30.00, all for only $19.95.

HEDDON "PAL" ROD & MARHOFF REEL $24.95

Save $12.55! New 1950 Model Shakespeare famous "Marhoff" level wind reel, plus the Heddon "De Luxe Pal" tubular steel casting rod—ft. 3" (discontinued length—fresh new stock). Rod is $22.50 Value. Reel alone is $13.20.
Both Rod and Reel, only.....$24.95

BALANCED ROD & REEL $25.20 Value, Both $9.95



AMAZING BARGAIN! "GEP", $11.20 Solid Steel rod with famous "pistol grip." Choice of 4½, 5 or 5½ ft. (discontinued models). PLUS $11.00 "De Luxe level-wind and anti-backlash Reel." Both are Top Quality! An Unusual Value!

WADERS $5.95

SPECIAL PURCHASE! Stocking foot waders to be worn inside shoes or boots. 100% Waterproof tough 12 Ga. Vinylite Plastic. Olive drab. Weighs less than 2 lbs. Satisfaction guaranteed. Fits all men 5'4" to 6'3" height. Very special @ $5.95

NEW ITEMS!

$15.00 Tubular Steel Fly Rod $4.99
$6.00 Telescope Casting Rod $2.59
Actionized Glass Casting Rod $9.95
$4.50 Fifteen Inch Tackle Box ...$2.99
New! "Gep!" Glass Casting Rod ..$9.95
Crosman CO_2 Gas Rifle or Pistol .$19.95
S&W K-38 Combat Masterpiece, 4" .38 Spcl. $65.00

SALE! NEW MERCHANDISE

$ 4.50 Universal Rod Handle....$ 1.88
19.95 Rochester 22 cal. Air Rifle. 9.95
17.50 Montague Casting Rod..... 8.99
22.60 Crosman 22-20 Shot Rptr.. 14.95
19.95 Nydar Shotgun Sight..... 9.95
19.80 Crosman 22 Air Rifle..... 11.95
.00 Buck Shot 12 Ga. Shells, 100 for 4.00
13.50 Solid Gun Case, for Shotgun 7.95
Special! Hand Carved Holsters..... 4.95
Husqvarna 30/06 or 270 Rifle....109.50
Bullet Trap, 18 lbs., for all 22 ctgs. 9.45

PAY 20% DOWN

KLEIN'S SPORTING GOODS, INC., DEPT. 33
227 W. Washington, Chicago 6, Ill.
(Send 25c for Special Catalog Offer or Free with any order from this Ad.)
Please rush me.....
Satisfaction Guaranteed or Your Money Back
Enclosed is $..... ☐ In full Payment. ☐ 20% C.O.D. deposit. ☐ 20% Time Payment deposit—balance to be paid in four monthly payments.
Firearms Purchasers Sign: "I am not an alien, and I have never been convicted of a crime of violence, nor am I under indictment or a fugitive from justice."
Signed .....
Occupation..... Age.....
(Write your Address on Separate Sheet)
No Guns Sold to Minors
OUR GUNSHOP DOES FINEST GUN REPAIRS, STOCK WORK, POLY CHOKE, ETC.

IF YOU DON'T SEE WHAT YOU WANT—WRITE US—WE HAVE IT!

New Beech Bonanza

(*Continued from page 44*)

makes it easy to appreciate the broad tricycle landing gear and excellent forward visibility. There's no reason to "S" in taxiing the *Bonanza* because you can see straight ahead without stretching your neck.

The gear is stressed through to withstand a vertical descent of over 600 fpm. The main gear carries 6.50 x 8 tires while the nose wheel uses a 5.00 x 5 tire. For pilots who operate out of dirt fields in wet weather, there is a mud scraper on the back of the nose-wheel tire to keep the dirt off the bottom of the fuselage and away from the prop. In addition, the main gear doors close when the wheels are down to keep out mud and prevent buffeting damage.

We climbed out and had lunch while Burt Bundy, Santa Barbara *Bonanza* representative, showed the airplane to several prospects.

"If you're after something new for your story, why not go into a little private airport down the beach?" asked Mr. Larson as he introduced George Hammond.

Mr. Hammond learned to fly at Ryan in San Diego in 1927 while "The Spirit of St. Louis" was under construction. Later he worked as an aeronautical engineer with the old Spartan Aircraft Company. In the past 10 years he has owned two stagger-winged Beech biplanes and hangared them at his house adjoining the Santa Barbara Biltmore Hotel. From the air his airport looks like a midget golf course—with a big "X" (closed) in the middle of the greens.

"Just how big is this airport," we asked Mr. Hammond.

"It's 1300 feet long," he replied, "but we have a permanent sub-zero approach."

We must have looked slightly dubious because Burt Bundy grinned and said, "It's okay. Mr. Hammond takes my own *Bonanza* in there all the time."

So the two of us took off in N8787A and headed south across Santa Barbara toward Mr. Hammond's private airport. It had begun to rain but visibility remained good.

Mr. Hammond swung the new *Bonanza* out over the water, slowed up and dropped the gear. We still had over a thousand feet when he dropped flaps and slowed up to an indicated 85 mph. The "airport" was a little green dot two miles ahead.

"I like to slow up way out here and get the feel of the ship," he said as he applied more power to keep the ship from settling too fast.

"I had to tear down a wire fence around the golf course," said Mr. Hammond. "Now I can come in nice and low over the water on a 'sub-zero' approach."

It was strictly sub-zero as we came in over the surf line. The high diving board of the Biltmore pool was way above our heads as we flicked across the beach at about 72 mph. Mr. Hammond eased back on the control wheel and we pulled up level with the runway. The wheels touched down on the grass within 100 feet of the end of the strip.

"See—there's plenty of room here," he said as we sped over the rolling ground. "I'll bet that we can come to a stop without even using the brakes."

There was a slight rise in the last 200 feet of the runway—a former golf green—and sure enough, we rolled to a stop without applying the usual brake pressure.

Mr. Hammond taxied around his house and showed us the layout of his two runways. The second strip measured an even thousand feet and cut off on a diagonal across the original strip toward the water. A slight shift in the offshore wind made it seem more reasonable to take off on the short strip that headed directly out over the water.

We taxied all the way up in the corner, checked the mags and dropped 10° of flaps. Mr. Hammond set the brakes and ran the engine up to about half throttle before he let the *Bonanza* roll.

We bounced down the uneven strip and the broad Pacific Ocean began to look bigger and wetter. The factory specifications call for a 580-foot brake-off roll at sea level into a 10-mph wind. We had the wind and the sea level, plus not more than six feet. The red stall-warning light flicked on briefly as Mr. Hammond brought the nose wheel off the ground but the *Bonanza* walked right into the air with quite a section of runway to spare.

"I take my stagger-Beech out of here with enough gas aboard to make Wichita, Kansas, non-stop, but I never try to carry a full load of passengers at the same time," said Mr. Hammond as we made a climbing circle back toward the beach and headed for Goleta. The 7,000-foot runways at the Municipal Airport looked immense.

A lot of thought has gone into the cockpit arrangement of the *Bonanza*. The instrument panel itself is very practical with all the basic flight instruments directly in front of the pilot. Engine instruments, rpm and manifold gage are on the right-hand side of the panel while temperature gages, oil and fuel quantity indicators and an ammeter are located in a group in the middle of the panel. Spaces for extra instruments are available at the right side of the panel. A Narco radio approach system was in the process of being installed on N8787A at the time this flight was made, but the unit was not complete and could not be flight-tested.

Switches for gear, flaps, lights, etc., are of the organ-console type with special safety catches for gear and flap controls. Mainline master and generator switches are still in a covered circuit-breaker panel just below the glove compartment on the far right-hand side of the instrument panel.

All *Bonanzas* have a tightly cowled engine and use cowl flaps for taxi, take-off and climb. Retracting these flaps adds 4 mph to the cruising speed. A new wrinkle in the cowling is the oil-tank access door so that oil can be checked and added without raising the whole cowling. Frequent scratches have occurred on previous models when pilots have let a screw driver get away from them while having to unfasten the whole cowling to check the oil.

Another simple little gadget adds to the completeness of the *Bonanza*. Lucite navigation-light reflectors on each wingtip make it easy for a pilot to check his lights in flight.

Also new on the B35 are three map pockets—one each on the back of the front seats and one for the pilot on the forward left side of the cabin.

For a landing on an entirely different type of private airport, we went out with Burt Bundy to John V. Crawford's San Lucas

(*Continued on page 55*)

Macchi MB-320

The Italian-designed and built Macchi MB-320 is presently undergoing flight tests. Of all-wood construction, this twin-engine seats six and is powered by Continental 185-hp engines. It has a cruising speed of 180 mph, a maximum speed of 195 mph and a landing speed of 69 mph. Practical operational altitude is said to be 23,283 feet, and its range is from 600 to 1,000 miles, depending on load and its flying speed. It has a retractable gear.

Life Line to Anywhere

(*Continued from page 27*)

world and among many nations which are fighting for recovery with their backs to the wall.

We arrived at Westover Air Force Base, near Chicopee Falls, Mass., Monday morning, December 19th. Westover is the headquarters of the Atlantic Division of MATS, then commanded by Maj. Gen. Archie J. Old, Jr. (relieved recently by Brig. Gen. James Spry). Lt. Col. Charlie Short, who had been most helpful in making all necessary arrangements, is Special Assistant to the Commander for Public Information. Someone told us the Colonel's colorful background included refereeing more than 20,000 boxing matches, and that for 22 years he was the "third man in the ring" for West Point and Annapolis, in addition to being a member of the advisory board of athletics for each of the famed academies.

A good idea of the far-flung activities of the Atlantic Division (ATLD) presented itself when I spotted a recent copy of *The Airliner*, an eight-page newspaper put out every Saturday under the Colonel's direction, and edited by Tech/Sgt. Joe Braden. The list of correspondents for *The Airliner* includes officers and enlisted men at Burtonwood Air Depot in England, Athens, Tripoli, Bermuda, the Azores, Orly Field in Paris, Rhein-Main and Wiesbaden, Germany. The ATLD extends beyond Athens to take in Ankara and Dhahran, from which side routes tie in Teheran (Iran) and Asmara (Eritrea).

Two other official MATS weekly newspapers are published in addition to *The Airliner*—one the *Trans-Pacifican*, published at Hickam AFB, Oahu, headquarters of the Pacific Division, and the *Continental Courier*, put out every Friday at Kelly Air Force Base, Hq. of MATS' Continental Division.

Col. Short took me in to see Sgt. Ira Story who runs the passenger control desk at Westover. I realized that the volume of passengers to and from Europe, Bermuda, the Caribbean and South America was considerable, but I hadn't realized it was quite as extensive as it is. MATS really is flying them in and out daily.

Charlie Short reported that a new responsibility of MATS since June 1949, includes Air Force responsibilities in the Hawaiian Islands and over a large area of the Pacific Ocean not crossed by scheduled air routes. Regular Pacific operations cover a route from Fairfield-Suisun to Hickam to Johnston Island, Kwajalein, Guam-Saipan (branch routes from there to Tokyo and to Okinawa), then on to Manila, Bangkok, Calcutta, New Delhi, Karachi to Dhahran (Saudi Arabia), at which point the Atlantic Division takes over.

The domestic routes tie together the main Air Force bases from Westover to Olmstead, Wright-Patterson, Oklahoma City, Biggs, March, and Fairfield-Suisun; another route connects MATS Hq at Andrews and also Langley AFB with the main route, and one in the west tieing in Ogden, Denver and Great Falls. Hospital flights of the Air Evacuation Service connect up several other points.

All this shows up on the big MATS maps, and by now it was apparent that Uncle Sam was running a whopping big airline on a worldwide basis. This was confirmed when I observed the bustling operations room listing all in-bound and out-bound flights, and after passing on through a regular airline routine in checking off names, weighing of luggage, etc. MATS takes particular pride in strictly on the button take-offs and arrivals.

We took off at exactly 1100 in our C-121 air-evacuation type *Constellation*. A few minutes later, when the *Connie* had reached an altitude of about 2,000 feet, Cpl. Edward S. Moore came into the cabin from the *Connie's* "front office" and welcomed us on the flight, outlined the flight plan, introduced (WAF) Sgt. Mary E. Griggs and further assured us they would do everything possible to make our trip comfortable and enjoyable. We had paid 35 cents apiece for a box lunch consisting of three sandwiches and a cup cake, and the corporal told us we could have this then, or at any time thereafter, but that it was customary to wait until the half-way point, about six hours out. Coffee, milk and fruit juices were available at any time.

That was about the last glimpse we had of the ocean as we climbed steadily to 17,000 feet and flew the rest of the trip over the billowy ocean of clouds. Cabin pressurization and air conditioning made us as comfortable as at the Waldorf, and the *Connie* was as steady as a clock.

I went up into the "office" and chatted with the pilot, Lt. C. E. Jarnigan; co-pilot, Lt. Boyne; navigators, Lts. Young and Keifer;

(*Continued on page 57*)

with EMBRY-RIDDLE Training

AIRCRAFT & ENGINE MECHANICS

An urgent need exists for properly trained A & E Mechanics throughout commercial aviation. Our C.A.A. approved school with a quarter-century of experience assures your quickest advancement. Embry-Riddle students learn fast with modern equipment...working on live aircraft in airline-size hangars.

AERONAUTICAL ENGINEERING

Embry-Riddle's 2-yr. Aeronautical Engineering Course provides training at the technical institute level. Engineers with management responsibility enjoy highest salaries!

A & E COMBINED * WITH COMMERCIAL

Airmen with dual pilot-engineering ability are needed by aviation companies and operators. Embry-Riddle combination training offers you the most in your aviation career.

*Not available to veterans, but combined courses may be taken consecutively with proper justification.

COMMERCIAL PILOT

Embry-Riddle trained pilots benefit from our years of experience with 30,000 students...the best instructors, up-to-date aircraft, superb year-'round flying weather . . . qualifications unexcelled anywhere. Instrument and instructor's ratings also available.

Never has there been such opportunity for properly trained men in commercial aviation. Put yourself one step ahead of the crowd. Start your career now at Embry-Riddle -- dormitories directly on the airport. For full information fill in the coupon below and mail today!

Embry Riddle International
SCHOOL OF AVIATION
MIAMI 30, FLORIDA

Dean of Enrollments - Dept. 93
Embry-Riddle School of Aviation
Miami 30, Florida

Please Print

NAME _____

ADDRESS _____

City _____

State _____ Age _____

I am interested in...

- ☐ A.&E. Mechanic
- ☐ Commercial Pilot
- ☐ Engineering
- ☐ A.&E. Combined with Commercial Pilot *
- ☐ Flying Mechanic *
- ☐ Drafting & Design

Check One { ☐ Veteran ☐ Non-Veteran

TRAIN IN MIAMI--AIR CAPITAL OF THE WORLD

MARINE CORPS takes over its first Fairchild *Packet*. Lt. Tweed *(right)* polishes up the insignia while Capt. T. R. Merritt looks on from up front in the R4Q's pilot's seat

What's in a Trade?

(*Continued from page 25*)

as a physician would—and as carefully! An airplane is like a human being; it will give you manifestations of all its ills if you can but interpret them. Add all defects up in terms of costs of repairs, and deduct these from current values.

2. See that every CAA paper is in order, and each log book for airplane and engine is complete and current. If possible, contact the A & E mechanic who performed the last 100-hour inspection, and ask him in detail about the airplane. Do not take any excuses for the lack of any paper or latest log book. Delay the trade until proper papers are produced. If the other party wants to trade badly enough, he'll produce them. If he can't, you won't be able to either, and when the airplane comes up for license, you'll be out of luck. Be especially careful about the registration ticket. See that there is a name from the Washington CAA office written at the bottom of the ticket. With typical clouded perception, the CAA has made the temporary ticket and the permanent ticket identical. Thus, anyone can make up the temporary, stick it in the airplane, and represent title as being clear. More than one amateur trader has been badly stung by this unwitting co-operation on the part of the CAA. See that the Airworthiness ticket is current and pasted on the plastic shielding, or in some prominent place. Don't take that worn-out excuse, "It blew out the window last week," as every valid CAA paper may be replaced (for a fee).

3. In answering advertisements for sale in well-known trade papers and magazines that carry classified advertising, watch the following three things:

(a) Distance to be traveled to the trade scene. That ship on the Coast is just what you are looking for. True, but remember this—except in a very few cases you will find, by careful watching and waiting, an identical ship within five hundred miles of you. Maybe the first is a bargain, but if you will compute the costs of travel, then multiply this by two, add six bourbons and cokes for each night out and throw in an extra 10 spot for that newest of legal bandits—the airport taxi, you will slow down on that long-distance thinking. You will, that is, unless you need a vacation from your wife.

(b) Never trade on his home ground. Many are the suckers who have flown many hundred miles to accomplish a fair trade, only to find that the fellow on the other end simply wants to get you out on a limb where he can do some fancy chiselling. Before the last war, I fairly represented a *Cub Coupe*, and after an exchange of letters, headed to New Orleans from Indiana. This is not too bad a hop in a *Cub* for an anticipated $100 profit. We left the airplane, and presumed the sale was completed. As the other party was a well-known business man, we had no worries and so took the next bus back to Indiana. A few days later, I received a polite letter stating that the ship was not as represented and that he would give me several hundred dollars less than the original price. Luckily, I had enough money so that he didn't have me out on the well-known limb. I refused to accept the new lower contract, and had the ship flown home. Yes, gentle reader, I should never have left without a check. I know that now, but it cost me almost $200 to find out that a well-to-do New Orleans business man can chisel just as well as Joe Doakes. A law suit would have been futile and taken years to win. I have known of many similar cases so—don't trade on *his* home ground. If you have to give a little, meet him half-way. Then if the trade is not completed, both parties have made an honest effort.

(c) Pretend you are a professional stock-market broker. Watch the tape. Know values. Read all available reports. Memorize all prices on all the current sales journals. Make a graph of the model in which you are interested. I have spent hour after hour constructing a graph on models in which I was interested. A red line for price, a blue line for engine hours, a green line for license expiration date. This is a real hobby for you embryo pilots. Knock off a $100 for each serious accident; knock off another hundred for each year of fabric deterioration. Average fabric life on fabric airplanes is five years. Then when you find the lowest average of all these ships in a particular model, write your letters to verify the advertisement. Construct a page concerning the data you wish with plenty of blanks to fill in. The other fellow then will know exactly what you want to know, and will be able to answer all the pertinent questions on your data page.

4. Know your fabric! This cannot be emphasized too much nor too long. Fabric airplanes have to be recovered every four to seven years, depending upon the amount of sunlight to which they have been exposed. With the new "Amalgamators" and "Rejuvenators" now on the market, a clever mechanic (notice I said "clever," not one with a conscience), can bond in old dope to make it look like new—and over deteriorated fabric, too. The obvious danger of flight in such aircraft should not be minimized, but the other thought can hurt just as much in a different way. The first 100-hour inspection will bring the condition of fabric to light, and you may be faced with a $500 fabric-recover bill.

In fabric testing one must consider two things: (a) the dope, and (b) the condition of the fabric underneath the dope. Each one may go bad without necessarily immediately affecting the other. I have seen good fabric covered with myriads of checks and ringworms. Chemical solutions will solve this problem for 50 or 75 dollars. But if the fabric is bad, better shy away from the airplane. Don't buy it no matter what the inducements. The CAA has conceived a "strip test" in which a strip of fabric is tested for tensile strength. If it tests to a specified strength, the fabric is good no matter how bad it looks. This test is satisfactory, provided conscience is used by the other party. However, in the hands of unscrupulous people, this test may be twisted around several ways. Either run the test yourself, or know personally the people who have made the test.

The best test that I know is still the middle finger test: push your middle finger down, gently at first, then firmly. Should the fabric rip at any time, be careful of purchasing that airplane. Try your test all over the topside of the airplane, not just in one or two places. This test will not harm in any way the dope or fabric of any airworthy aircraft, and with experience you will know

(*Continued on page 52*)

New Soviet Jet Fighter

(*Continued from page 21*)

with the early model B-36's ability to evade Soviet jets known to be in existence. High Air Force personages and officials who *should* know, have confirmed the existence of advance-design Soviet jets. The writer has seen authentic photographs, albeit blurred and obviously taken by tele-photo lens, of such types.

The drawing on page 21 is based on telephoto films from the same sources, and is as accurate a reconstruction as is possible to get on the available evidence concerning this new Soviet fighter which has a lay-out as advanced as an American or British jet in service. This Russian fighter is actually in large-scale production and is being delivered to crack Soviet Air Force fighter regiments.

Details on design origin of this fighter are hazy at the moment; some crediting it to A. S. Yakovlev, the designer of the research airplane with which Russia claims to have exceeded Mach unity by a handsome margin, and label it *Yak-21*. Other sources hint that it originated from the design group headed by S. A. Lavochkin, well-known for his series of piston-engined fighters such as the La-11 with which most Russian fighter elements, based in the Russian-controlled zone of Germany, are misleadingly equipped. Although there may be some doubt regarding the parentage of the new fighter, there can be no doubt at all as to its denoting a radical step forward in Russian-design technique, and its appearance proves that behind her outlying ring of Air Force units using obsolescent types, the Soviet is refitting her fighter elements with types well able to oppose *any* United States or British jet.

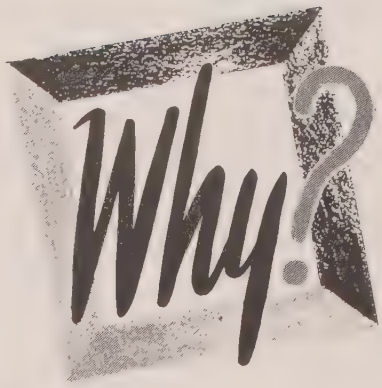
Eye-witnesses have frequently reported seeing groups of 15 or 20 swept-wing jets, and there can be little doubt that the design illustrated here is not the only type in service. Immediate postwar jet fighters—such as the *Mig-9* and the *Yak-15*—had no sensational design innovations and apparently did not serve in large numbers. Instead, they have probably been used in service-test batches by special Russian experimental squadrons to gain know-how on jet-operating problems and to familiarize a nucleus of master pilots in jet flight and combat tactics. Undoubtedly, experience gained in these *Mig-9's* and *Yak-15's* has been built into the new generation of jets now rolling off the Russian production lines and even in squadron service. These early *Migs* and *Yaks* have been handed on to secondary units, probably in the Eastern and Asiatic sectors of the U.S.S.R. Meanwhile, crack air-fighting regiments have been re-equipped with the Russian *Thunderjet*, a straight-wing design thought to be the *Yak-17*, and swept-wing designs by Mikoyan and Gurevich, Lavochkin and Yakovlev.

Crux of these latest designs is that they not only embody in practical form the advanced ideas of German technicians now working for the Soviet, ideas upon which many American design theories are based, but are almost certainly powered by a new powerful range of turbojet engines, including copies of the Rolls-Royce *Nene* and *Derwent* jets imported two years ago from Britain. Both these units are among the most reliable available anywhere in the world, and that the *Nene* in particular has great potentialities is acknowledged by the Americans who are building it under license. These units are a simple centrifugal lay-out ideally suited to Russian methods of mass production, and it would be too much to hope that the Russian technicians have not improved on outputs by after-burning or water injection, both of which were known to the Germans. Russian *Nenes* are certain to be giving 5,000 pounds thrust despite *possible* lagging in Soviet manufacture of heat-resistant materials. Note we say '*possible*': we say it with our tongue in our cheek for there is no definite information that Red scientists are far behind the Americans and Britain in metallurgical research. In general, however, the life of Russian *Nenes*, operationally speaking, is likely to be rather shorter than that of the British originals due to mass production methods favored by the Soviet.

Note that the new fighter is as advanced in lay-out as the F-86 *Sabre*, combining 40° sweptback wings (5° more than the American fighter) with a sharply swept-back fin and 'T-positioned' tailplane. The fuselage is of fair aerodynamic form with a normal straight-through arrangement of the air ducts. The nose ram entry is lipped above to maintain adequate airflow in tail-down position, after which intakes presumably bifurcate round the cockpit to the plenum (pressure) chamber, necessary with the Rolls-Royce twin-sided impeller designs. The cockpit is well forward, having a 360°-vision canopy along American lines. Armament is in the lower portion of the fuselage nose, under the cockpit flooring, and appears to consist of four cannon—probably of the reliable, high-fire-rate, 20-mm ShVAK type. Another variant of the same machine has a noticeable belly bulge, possibly housing a 37-mm cannon for anti-tank and close-support work.

The T-positioned cantilever tailplane, mounted on a large-area sweptback fin, is presumably so mounted to avoid broken airflow from the cockpit canopy. Tail-sweep angle is approximately the same as the wings (40°). The low mid-positioned high-speed section wing has a 40° sweepback and possibly a slight droop dihedral. The wing has very little taper and automatic slots are presumably installed in the leading edge to combat the poor low-speed lift penalty of sharply sweptback wings. Due to generous area and light weight, wing loading is probably low enough to confer good maneuverability, ceiling and rate of climb. Roll rate should be hot. Service ceiling is very likely to be upwards of 45,000 feet, and assuming 5,000 pounds static thrust output, the Russian would probably out-perform the F-84E *Thunderjet* on most scores except range. Maximum speed of the new Soviet fighter is as high as 690 mph (Mach 0.91). At medium altitudes it might even match the F-86 *Sabre* (its maneuverability in a dog fight would almost certainly be better than the American machine) and should be easily capable of reaching any fighting formations of B-36's and B-50's.

Apparently with a combination of German airframe designing genius and the world-famed Rolls-Royce *Nene* turbojet, the new Russian fighter would appear to be an extremely formidable opponent and one that may truly shake Congressional policy-makers who think to reduce expenditure on USAF re-equipment.



QUESTION:

Why do the experienced "old-hands" of executive aviation prefer to have their instrument work done at Southwest Airmotive?

ANSWER:

The SAC instrument shop is an authorized representative of Eclipse-Pioneer, using fine, precision equipment and factory specified methods. Instrument technicians can do their work while other SAC departments carry out additional assignments. This is "ONE STOP SERVICE" which saves you both time and money. Those who regularly patronize our instrument shop, find . . .

CUSTOM DESIGNING

SAC designs, makes, and installs a wide variety of panels to suit the individual pilots' requirements . . . Twin-Beech and Lodestar panels are a specialty.

SKILL

SAC instrument men are factory trained, and have devoted many years to servicing executive aircraft equipment.

FLAT RATES

There is a SAC flat rate to overhaul practically every known type of instrument.

Write the SAC Service Representative TODAY for your copy of the flat rate listing of instruments.

"THE FLAT RATE COMPANY"

E S N W

Southwest Airmotive Co.

CAA Approved Repair Station No. 195 | LOVE FIELD, DALLAS

...over the Caribbean

(*Continued from page 33*)

of submarines, aircraft and 4,500 ground troops. From the United States, an offensive armada of 50,000 naval, air, and ground forces, including 16,000 assault troops, was directed to seize the island and convert it into a base for a strategic air offensive.

The task of movement of men, ships, planes and supplies was gigantic. Naval escorts, including six carriers and the "Mighty Mo," and convoys in four main task forces embarked from Norfolk, 1,500 miles away! Land-based aircraft, their operational ground personnel, and first-echelon maintenance requirements were flown and air-lifted from bases in the continental United States. Embarkations started in early February and culminated in a D-day beach assault on March 8th, followed by full-scale land "combat," mopping-up, and consolidation.

The complexity of such a joint operation was staggering. Post-war men of all ranks but without actual wartime experience learned "the hard way" of the long, careful preparation required to weld hundreds of specialized units into an integrated, efficient combat team which can be depended upon to gain objectives with the minimum of forces, waste . . . and casualties. In this operation even the casualties were counted! Eighteen hundred umpires accompanied every field and tactical unit as well as weighed the records at command and staff levels. For the first time in a peace-time exercise, an Air Force officer, Major General Paul Williams, Air-Borne Commander in France and Germany, was a member of the top Umpire Team.

The watch-word of PORTREX was *unification* . . . training for integration of the branches of our armed forces, not merely coordination or cooperation. Commands and staffs of the four forces involved were composed of Army, Navy, and Air Force officers working and living together for a single result. On the staff of Admiral W. M. Fechteler, over-all maneuver commander, were Major General Robert M. Lee, war-time deputy commanding general of the Ninth Air Force; Vice Admiral D. B. Duncan, and Brig. Gen. C. E. Ryan, USA.

The chief Umpire, famed Lt. Gen. Leroy Hunt of the Marine Corps, was assisted by Maj. Gen. P. J. Mueller, USA, Rear-Admiral F. D. Kirtland, as well as by Maj. Gen. Williams, USAF.

The Invasion Commander, Lt. Gen. J. R. Hodge, had as Air Force forces leader Major Gen. Ralph Stearley, who led the Ninth Tactical Air Division in Europe. Rear Admiral J. Wright, who participated in the fast carrier operations in the Central Pacific and led an amphibious force into Okinawa, was Navy invasion force leader. Maj. Gen. P. W. Clarkson commanded the assaulting Army units.

Similarly, all three services were represented on the staff of Lt. General W. H. H. Morris, Jr., in command of the Caribbean area as well as the defensive "Aggressor" forces.

Not only was this the first realistic joint exercise for the majority of men in the ranks without previous combat experience, but it was invaluable for command and staff officers whose European service had not included this type of amphibious operation, where success depended upon inter-service coordination.

These basic values must compensate for many of the shortcomings which were sometimes evident in the complex and rigidly time-tabled exercise, especially in communications and close support.

As the maneuvers unfolded, Air Power acquired a new meaning for every participant and observer. Practically every application of land- and sea-based air power played a part in the over-all objective with the notable exception of bombardment, other than fighter-bomber, units. The emphasis was on tactical and naval operations.

At sea, long-ranging Lockheed *Neptune* P2V's from land bases in the United States and Puerto Rico employed their radar-guided striking power both against surface and submarine units. Consolidated Vultee *Privateer* PB4Y's made night interceptions of the invading fleet and were credited with heavy damage to the flagship. Like all other umpire-ruled casualties of "sinkings," the aircraft, ships or units involved were ruled "out of action" only for a limited time, then they were restored to the exercise in order to give every unit the entire training time.

Carrier-borne Grumman *Bearcat* F8F's and Douglas AD's provided cover and striking power at sea, ranging to make a simulated strike against Bermuda where Aggressor seaplanes were theoretically based.

Hunter-Killer groups of escort carriers and destroyers guarded the van and flanks of the convoys from Aggressor submarines, which included several "Guppies" equipped with snorkels to permit long submersion and higher underwater speeds. Despite the efficiency of airborne radar for anti-submarine warfare, the submarines took a heavy toll. In a brilliant and daring attack against the landing flotilla, an Aggressor submarine penetrated the defense screen and was credited with sinking five transports and damaging the battleship *Missouri*.

Two squadrons of carrier-borne McDonnell *Banshees* F2H's were employed in close ground support after D-day. Their land strikes, like other air and naval units, were directed against the uninhabited "impact area" of Vieques. Here, bomb, rocket and gunnery targets were marked off to correspond with the actual targets in the "maneuver area" of the island where the ground forces were locked in combat.

The destructive threat of combined air and submarine forces against convoys was manifest to the 50,000 men afloat. Their safety depended less upon the fire-power of their close escorts than the air and submarine counter-measures of their distant carriers and hunter-killer allies. Consolidated Vultee *Catalinas* and Martin *Mariners* in long-range patrols guided attacking submarines as well as made direct strikes.

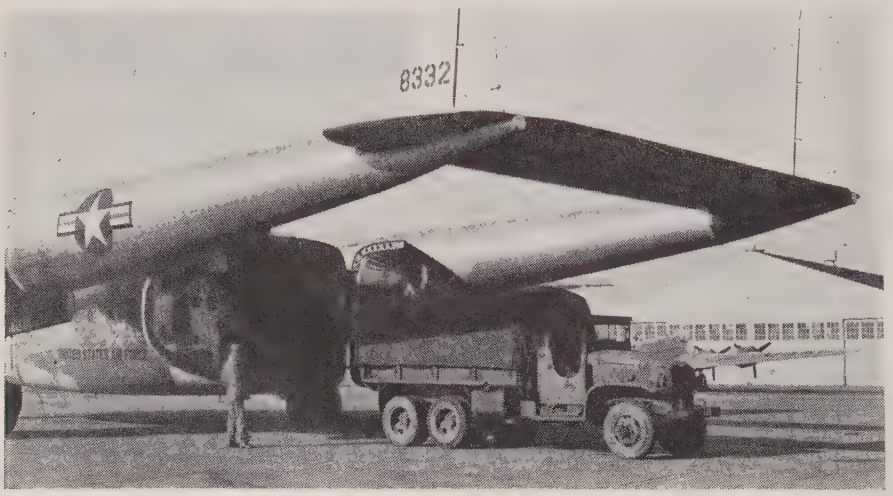
Naval aircraft ashore made distinguished records. Grumman *Panther* F9F jets were flown for the defensive forces by Marines. In their first participation in a joint exercise, they maintained a high availability and gave serious trouble to a superior force of invader F-84D's. Vought *Corsair* F4U-5N night fighters with radar intercept equipment defended the invader's main land field, Ramey Air Base on the western tip of Puerto Rico, and were close to sure death for heavy night intruders.

The land-based spearheads of the invading forces were the famous 20th Fighter Group with Republic *Thunderjet* F-84D's and the 31st Fighter Group with F-84E's. These 500-mph-plus fighter bombers carried a wallop of rockets, bombs, and 50-calibers equal to the broadside of a destroyer. The invaders were set back by operational grounding of the F-84E's for mechanical trouble that could not be corrected under field conditions. The F-84D's were the mainstay of attacks on Vieques and Aggressor fields that resulted in the Umpires' declaring Aggressor aviation "neutralized" before the carrier-based aviation appeared.

Photo-reconnaissance vital to the invading forces was carried on around-the-clock. Jet Lockheed P-80's with forward, oblique, and vertical cameras ran low and high sorties by day. At night, RB-26 *Invaders* with 375,000,000 candle-power flash bulbs and higher-powered flash bombs used precision radar navigation methods like Shoran to pint-point their photo areas.

The climax of the assault on Vieques was D-day, March 8th. The climax of the exhibit of air power was the drop of 800 paratroopers of the famed 82nd Airborne Division, timed an hour before the beach landings in order to seize heights commanding the air-strip and to disrupt communications. In perfect formation, 40 Fairchild *Packet* C-82's poured the 316th Group into the drop-zone at 1,000 feet. With a brisk wind and rough terrain, there were 72 drop injuries,

FAIRCHILD C-119 *Packets* were loaded with supplies for Portrex, flown to Puerto Rico



including 10 evacuated for X-ray diagnosis. It was a magnificent spectacle, but with these artificial conditions and restricted terrain, "it was not war." Defenders, alerted by offensive preparations, were judged to have inflicted 50 per cent casualties before assembly and deployment. With the irony characteristic of so many combat-bombing experiences, the drop of supporting artillery a few minutes later was poorly aimed and fell into enemy hands.

The spectacular beach assaults were nearly an all Army-Navy show as heavy naval gunfire from the *Missouri*, three cruisers, and rocket ships simulated the type of thunderous support which swamped the defenses of Pacific beaches. Air power strategists, amateur and professional, can chew on three questions:

. . . would the A-Bomb, ruled out of PORTREX, make this type of amphibious assault impossible?

. . . would Air Force heavy bombardment supplement or replace the battlewagons' weight of metal?

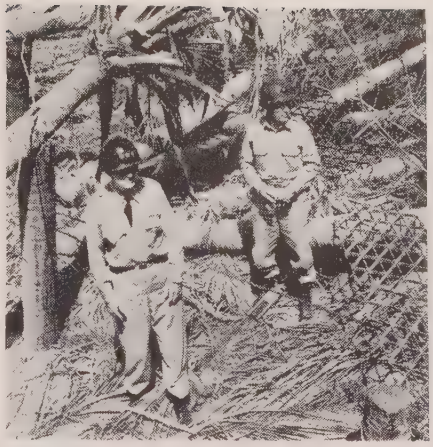
. . . should land- and carrier-based fighter-bombers' flexibility and shock-power be entirely dispensed with on the beach-head?

With the beaches secure, the heavy invader strength beat down the smart but out-numbered aggressor. In three days, 15,000 men, 1,600 tanks and vehicles, and 35,000 tons of supplies were put ashore. Carrier and land planes supplied the flying artillery to break the final defense lines.

Central control of combined air power through a Tactical Air Coordination Center was severely tested and often found wanting. Intensive analysis will have to define the reasons and their correctives. Tactical air control parties attached to ground units often failed to summon their supporting planes; communications broke down—there were 12 failures on D-day. Within four days, there were four shifts of air control: land to ship command, to assault command (ship), to shore. Army, Air, and Naval procedures are not, and probably never can be made uniform. From such joint exercises will evolve the answers which pure doctrinal research cannot attain by itself.

Errors and malfunctions in such vital co-ordinating sinews as radar and communications can be costly. Night intruders over Ramey Air Base, loaded with aircraft, knocked out the radar and tactical control center for less than an hour. A few attackers then jumped the "blinded" field despite its defenses and destroyed a good proportion of its dispersed aircraft.

This was a "gold-fish bowl" exercise. The absence of new equipment or basically new tactical doctrines was disappointing to many who did not consider the risks of disclosure. Hundreds of observers, including Secretary of Defense Johnson, Secretary of the Navy Matthews, Chief of Naval Operations Admiral Sherman, General Mark Clark, Senators Knowland and Cain, Representatives Fisher and Clemente of the Armed Services Committee, witnessed the operation from the island as well as at information centers. It is certain that *practical* integration has taken a large stride forward.



BARRICADES set up by Aggressor Forces made going tough for Invasion Forces

Prepare at P.I.A. for Big Opportunities in Aviation

SUCCESS in AVIATION depends on training at the RIGHT school. PIA, a government-approved school in operation since 1929, has grown up with Aviation and has students in attendance from all over the United States, not to mention countless graduates who are holding key positions in Aviation all over the world. We are PROUD of our PLACEMENT RECORD—We are DOUBLY PROUD of the fact that the majority of our new students come to us through recommendations by former graduates. Airline representatives seeking Aviation personnel regularly visit the Pittsburgh Institute of Aeronautics to examine graduating classes for qualified applicants. Almost daily, requests from small airport operators are being received for graduates with our type of training.

T. B. LYONS, *President*
B.S., M.A., Ph.D.

APPROVED FOR VETERAN TRAINING

Dr. T. B. Lyons, President and/or Treasurer—formerly Pittsburgh Public Schools—formerly General Mgr. of Graham Aviation Company—Phi Delta Kappa—member University of Pittsburgh Doctoral Association—Secretary Nat'l Federation Private School Associations—President of the Pennsylvania Association Private Vocational Schools—Listed in WHO'S WHO in American Education.

DAY AND EVENING CLASSES

MAIL COUPON FOR COMPLETE INFORMATION INCLUDING STARTING DATES OF CLASSES

PITTSBURGH INSTITUTE OF AERONAUTICS—Dept. B
Aviation Bldg., 100 Seventh St., Pgh., Pa.

Name ..... Age.....

Address .....

City ..... State.....

☐ Aircraft & Engine Mechanics (A & E)
☐ Industrial and Aircraft Instruments
☐ Drafting & Design
☐ Aviation Secretarial & Airline Reservations
☐ Veteran ☐ Non-Veteran

PITTSBURGH INSTITUTE OF AERONAUTICS

AVIATION BUILDING, 100 SEVENTH STREET, PITTSBURGH 22, PENNSYLVANIA — ATLANTIC 0800

FOUNDED 1929

What's In A Trade?

(*Continued from page 48*)

just where to test. Should the other party forbid this practice, by simple deduction you will know the condition of his fabric. This test is not held in great favor because many of the CAA Inspectors used to draw back and, using their thumb, give the airplane a blow that all but shattered the fabric. Using the correct shoulder muscles, one can destroy new fabric in this manner, or at the very least cause a depression which will result in ringworm. The middle finger used with firm pressure will not cause harm. A word of caution, however—first ask the other party if this procedure is permissible.

5. Do not trade for war surplus unless you are wealthy and have much leisure time. Ships that were built and used in the period from 1942 to 1945 are now many years old, and 99 per cent of them have stagnated and been exposed to the weather at least part of their life. I will not go into the many things that could be wrong or could go wrong. Suffice it to say that the average postwar amateur has no business with a war surplus ship. His ability and wallet are not up to it. A friend of mine, a young and handsome ex-G.I. with all of the pre-requisites for a long happy life in aviation, had logged some 70 hours of postwar *Cub* time. Over my studied objections he purchased a BT-13A, and proceeded to buzz the countryside without adequate or legal check-out.

"Ed, this thing is simple to fly," he scoffed.

The next day after a secondary stall at 20 feet above the ground and at an estimated 180 mph, this friend took himself and another permanently out of this world. Even the local junk yard was not interested in the remains of his airplane.

Naturally, there are many exceptions to this rule, but the average amateur pilot ought to stay away from Army surplus. It will get him in one end or the other.

6. Be sure the airplane is licensed. There are very, very few airplanes licensed for less than 25 dollars, and most of them will average much higher. If the airplane carries a current certificate, you can rest assured that you will have happy hours of flying until the ticket expires. But if there is no ticket, you may spend as high as six months and several hundred dollars getting the ship licensed. If the other party states it will license easily, then be sure that *he* licenses it *before* the trade, *not* afterwards. Too many innocent purchasers have been permanently soured on aviation because of the glib suave talk of sellers, only to later find a repair bill that puts them out of aviation permanently.

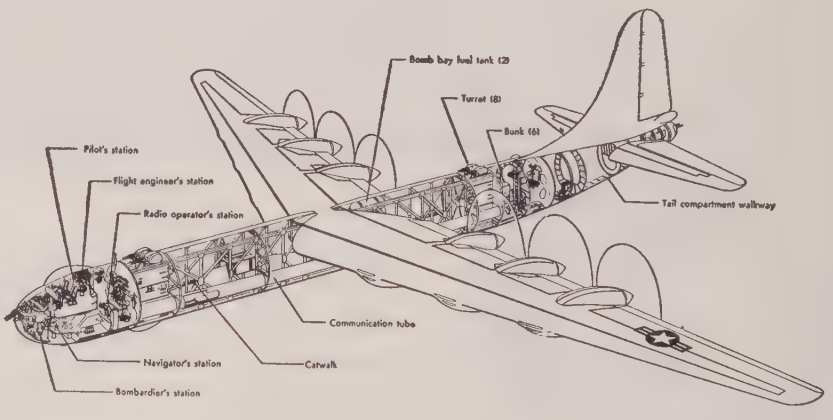
"This ship'll license easily" is the "hocus pocus" to which Mr. Roget probably referred in his book of synonyms.

One must always think in terms of subsequent disposal of this airplane. What will be its status next year? Is it Fall? Is it Spring? Do I have 10 hours flying before grounding, or 200? I believe a good rule to follow in this respect is not to trade for any airplane the license of which will expire within three months. If the aircraft has been a club ship or a trainer on a program, the chances are that it will need a bit of work before re-license. With at least three months still on the license, you will have plenty of time to get value from the ship before spending some money on it. If it was privately owned and operated, the airplane may not have had any maintenance for the preceding nine months; in which case, when it does come up for annual inspection, many things may have to be done.

7. See that all CAA bulletins have been complied with. CAA engineering is constantly at work trying to remedy any defects that show up in airplanes. A bulletin is a written order to all owners and certificated mechanics from the CAA, requesting that certain modifications and parts be applied to a particular model of airplane to further its airworthiness. Possibly spars have been failing in a particular model, and certainly you don't want to become a case history. The CAA will have found a way of remedying this spar defect simply, and the bulletin is the order to 'beef up' the spar. These bulletins usually have to be complied with at 100-hour inspections. Look at the last 100-hour entry in your aircraft log book, then ask the nearest A & E what bulletins are applicable to this airplane. He will gladly tell you without charge. Between these two you will know if they are up or not. Bulletins are sometimes costly in time and money, so let's let the other party comply with them, or get in writing from an A & E a statement of proposed cost, and deduct this cost from your transaction. Be sure—not sorry!

8. Consult your operator on your airport. No doubt he will try to sell you his merchandise first. Well, look it over and see if it fits all your requirements. Then ask him about the particular model of airplane in question. He's a hard-working fellow. He's trying hard to make friends, and he probably isn't making any money. Most operators are fairly open-minded and will be glad to tell you the good and bad features of any given ship. Bear in mind that a *Cub* operator will fight for *Cub* sales; Aeronca dealers for Aeroncas, etc. If you have in mind a Luscombe 8A, check with a *Cub* dealer, then with a Luscombe dealer, and balance the two. My point is this, these fellows will know pretty much what is good for you and what isn't. You are a fellow of 190 pounds, and your wife weighs 140 pounds. It will be obvious to him that you have no business in a C-3 Aeronca—if that's the ship you found for only $395. I've owned C-3's and liked them, but it will strain those 40 horses in that two-cylinder engine to the utmost just to get you both airborne, and on a calm, scorching day your take-off from a small airport will be something that calls for an ambulance. This is an extreme example, but it's surprising how many pilots are mis-mated to their airplanes. Your operator will make an honest effort, if you'll let him, to help you get the right ship. He will also give you many pointers that will save you money, if you will but listen. The only other type of person that gives out so much good free advice is your minister.

9. Procure an experienced mechanic to check the ship in which you are interested. There is at least one good man, certificated or not, that hangs around every airport. For a small fee, or even for a little flying time,



B-36 LAY-OUT

A cutaway drawing of the B-36 recently was released by the USAF. This drawing (*above*) shows the general arrangement of the plane's 162-foot fuselage, with bomb bays capable of carrying up to 84,000 pounds of bombs. Twelve of the big '36's sixteen 20-mm cannon are visible. This sketch is of a B-36 powered by six 3500-hp pusher-type engines. Latest models of the '36 are equipped with four jet engines, mounted two to a pod, in addition to the six reciprocating engines. A B-36 like the one above flew more than 10,000 miles non-stop, carrying a 10,000 pound bomb load half way. Whether or not this mammoth bomber would be easy prey to jet fighter aircraft of the Air Force is still problematical. Thus far tests to prove the point or to negate it have not been permitted by the Chiefs of Staff. The B-36 remains in production at Consolidated, with improved versions coming up.

he will inspect the airplane and save you many, many times the cost of his services. It is elementary economics to invest $10 to save $200. Had I had an experienced mechanic to check that 50-hp *Cub* I bought in Kentucky, he would have found that cracked spar immediately. I took it for granted that since the papers were in order, the spars were airworthy.

10. Trade with reputabe dealers and operators. I approach this rule apologetically, as we hope we (Aero Traders, Unlimited) are included in this class. However, from long experience you will find this is good practice. In the first place, fixed-base operators have training operations. This means proper maintenance, correct usage of aircraft and, usually, proper records. They also employ skilled mechanics whose one job is to maintain these aircraft. The mechanics have nothing to gain by skimping on work—manual or paper—and everything to lose. In the second place, they are proud of their position on the airport, and will not disseminate any false information or misleading statements concerning their wares. Their reputation is of paramount importance, and it is a rare operator indeed who will by artifice induce you to trade for or purchase an airplane not up to specification.

On the other hand, it has been found to be a fairly common practice for the private owner, pardonably so, to exaggerate the airworthiness of his airplane, to make not false but misleading statements, and to forget at times the necessity for logging every single hour that particular airplane has flown. Those of you who are scrupulously honest in this regard, please do not throw Irish confetti at me, as this statement does not apply in your case. However, look around you, and see if you do not see this unethical cheating at times.

In conclusion, it is the writer's humble suggestion that any trade be preceded by the presence of an experienced mechanic, and don't make any commitments prior to inspection. We all know that one story of Abraham Lincoln in his younger days. He was to meet a trader in Springfield to trade horses sight unseen. The trader arrived first with one of the sorriest, oldest, decrepit nags to be found in southern Illinois. Amidst general laughter it was conceded that the trader was bound to get the best of the bargain. However, when Lincoln came stalking into the market place with a wooden saw-horse under his arm, the tables were turned. Yes, they had traded sight unseen. Be careful on those trades!

I find that experience teaches us very little. Last week I traded a "jim-dandy" Culver *Cadet* in perfect condition, plus a Ryan PT-22 needing lots of work and so represented, for a Fairchild 24, 145 Ranger, FAF my airport. The fellow flew his airplane in, we traded, and he flew the Culver out, leaving instructions to load the Ryan onto a truck. After he left, I piled into the Fairchild with my kids, and we decided to fly awhile. The starter wouldn't work, the battery was no good, the generator wouldn't generate, no compression on two cylinders, and the engine wouldn't turn up over 1200 rpm when it takes more that 1750 to lift this one off the ground. Right now I am busy with an engine overhaul. Griped? Yes, but still fascinated with this business of swapping. If you've made a bad trade in spite of all the above morbid rules, grin and better luck next time.

Air Photos Pay Off

(*Continued from page 31*)

Last summer here in Washington, D. C., a large real estate company that had fostered some 15 major developments, wanted tangible evidence of its prowess in the form of photos—including aerial photos of each project. The company wanted three separate 16 x 22-inch photos of each development framed for hanging in its offices so the executives could sit back and gloat at their accomplishments. In addition, the execs wanted six complete photo albums, each containing three 8 x 10-inch shots of each of the 15 locations, or 45 pictures per album. I took the job at a flat rate of $90 per location. This was on Tuesday; Wednesday I spent five hours in the air with a rented Piper *Cub* and a pilot, that cost me $40, plus $8 for film. Thursday noon, I paid my photo finisher $185 for his efforts and that afternoon delivered my work. I got a check for $1,350—which netted me a mere $1,117!

This case is not unusual, although I'll have to admit the majority of jobs are the one-picture type. Usually I try to sell a complete deal. This consists of an album of a dozen different 8 x 10-inch prints, three 16 x 22-inch prints framed for hanging, and 500 photo post cards. With such a plan I can usually run the price from $150 to as much as $500. My cost is less than $25 and includes an average of 30 minutes flying time, film, laboratory costs and $6.70 for the post cards. Sometimes, however, I get a customer who wants only a few pictures, with no frills. If such is the case, I have to be happy with $48, my base price. But I still net around $40.

Of the many factors to consider in entering into such a venture, the first and all important factor is, "Can I part the prospect from his cash?" Actually, that's not too difficult at all.

First thing you have to do is make sure the people in your locality know about you. This is easy—just list yourself in the classified telephone directory as an Aerial Photographer, then have post cards made with an enticing advertisement on one side and an air photo of some place of interest in your community on the other side, with your name set in bold type as "Air Photographer." Twenty-five hundred such cards can be had for about $14.50. Send these cards out to farmers, realtors, mortgage houses, banks, institutions, construction firms, factories and the like. The results should be spontaneous and gratifying. This should get you off to a flying start—and on a cash basis, too.

Newspapers will buy good aerial shots and frequently will go for a series or air photos on a "this is your community" deal. And there is always the possibility that you'll get your chance at the "big time" with a bang-up shot of something of tremendous national importance. When this happens, you can cash in with four figures as well as obtaining recognition as a really top-flight photographer.

Realtors have found that air photos of their various properties are indispensable and with them they can pre-sell their customers without ever leaving the office. This often saves needless and discouraging trips.

Equipment is not the bugaboo one would believe it to be. On the contrary, very little

(*Continued on page 54*)

SENSATIONAL VALUE

only $59.50 including tax

TWELVE HOUR RECORDER

17 jewels, 2 pushes, 6 hands, Incabloc shock-resistant. Records up to 12 hours. Sweep second hand. Time out feature. Radium dial. Anti-magnetic. Unbreakable crystal. Handsome, extra-thin stainless steel case.

No flyer should be without one Also ideal for physicians, engineers, radio men, etc. It's a stopwatch, telemeter, tachometer, perfect timekeeper. Will last a lifetime. Thousands used by our armed forces. Formerly **$150.** Famous make, brand new.

Guaranteed! Your money back in ten days if not satisfied for any reason. Mail orders promptly filled. Shipped postpaid for check or M.O. or will send C.O.D.

Exclusive with

WHITE PLAINS WATCH CO.

RIVER PARK 17C, WHITE PLAINS, N. Y.

SCOTT...A LEADING NAME IN AVIATION ACCESSORIES...SCOTT...A LEADING NAME IN AVIATION ACCESSORIES...SCOTT...A LEADING NAME IN AVIATION ACCESSORIES...SCOTT...A LEADING NAME IN AVIATION ACCESSORIES...SCOTT...A LEADING NAME IN AVIATION ACCESSORIES

Longer Life For Your Windshield AND CLEAR — Comfortable — Safer Vision

For preserving and cleaning plastic windshields. Non-abrasive. Will restore and maintain flexibility; helps prevent crazing and cracking. Restores visibility to old windshields by effacing mild scratches.

SPECIAL OFFER—Send a dollar bill direct to us for a trial can—limited time only.

PRICE—$1.25 pint Squirt Top Can FROM your Scott Dealer.

Established in 1932 — Scott — FOR SAFETY—FOR SERVICE

SCOTT AVIATION CORPORATION

226 ERIE ST., LANCASTER, N. Y.

Write for FREE 1950 Accessory Folder

Air Photos Pay Off

(*Continued from page 53*)

is needed—and what is needed can be inexpensive. True, an airplane is necessary, but you can either own one or rent one. Renting is cheap as rarely does the average job take more than 30 minutes flying time and that costs only four or five dollars. The type of airplane, however, is of major importance—the slower the better. The Piper *Cub* is ideal as it can go along at about 60 mph, just beating the cows to the barn by a head. Too, being a high-wing affair, it affords maximum visibility where visibility is needed—forward and downward. The person taking pictures does not have to extend himself in any unusual manner. All he does is sit still and, as the picture comes up, take it.

The camera doesn't have to be a pretentious affair either. Any camera of good manufacture with a good f.4:5 lens and accommodating film size 3 x 4 or larger will do nicely. Personally, I've found that the Graflex, either size 3¼ x 4¼ or 4 x 5, with minor modifications, will produce excellent results. Such can be had most anywhere in good condition, second-hand, for around $50. To adapt this camera for air use it's best to make three minor changes. First, mount ordinary screen door handles on the sides of the camera. These will make it easier to hold. Second, mount an outside optical glass view finder on the top of box. Third, make an extension of the trip mechanism. Presto, a first-class aerial camera with many advantages over the conventional air camera that costs hundreds of dollars. A good filter is necessary, this being but a matter of three dollars. This filter should be used whenever haze is present or on high obliques where portions of the sky and clouds are shown. Filter should be of the yellow type which excludes ultraviolet and most blue rays. I'd recommend Eastman's Wratten #12 or Chess-United's medium yellow. Fast film is not only desirable but makes your operations more versatile and both Ansco Super Pan Press or Eastman Super XX rarely fail to produce excellent results.

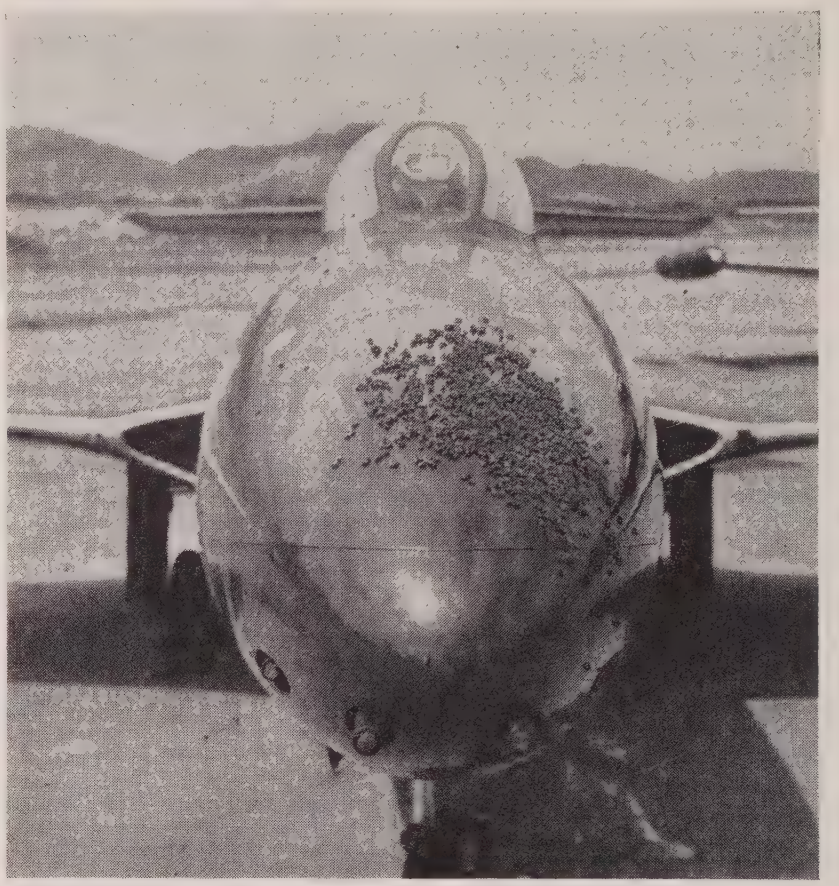
Having all the gear together now, all that remains is the "know how" which isn't the least bit difficult if rudimentary principles are kept in mind. First is the time of day: good light is basic as are shadows of trees and buildings which give a feeling of depth. It, therefore, follows that the ideal time to take air pictures is middle morning or middle afternoon. Care should be exercised to keep heavy shadows of clouds from appearing in your pictures. Light shadows are desirable as they will give contrast. Next—and a very important factor—is altitude. Due to the vast amount of fine detail contained in air photos, the lower the altitude the sharper and more distinct the picture will be. As the CAA frowns upon flying at 300 feet, try taking pictures from 500 to 800 feet. This is within open country minimums. Higher than 1,000 feet is not recommended as you lose the fine detail and the photo ceases to be a picture but becomes a general view.

Lighting and effects are best not square on the object to be photographed, but at an angle of 45°, that is, with the sun behind you at an angle of 45°. This way, the shadows will be very pronounced and depth will be registered to its greatest effectiveness. Therefore, the airplane should be flown so the picture will come into position at the required angle and about a distance back equivalent to the altitude.

Although we are all set to take the pictures now, make doubly sure everything is okay by running an equipment check. Filter, if to be used, is attached, care being exercised to see that lens and filter are clean. For cleaning, use lens tissue only. While on ground, focus the camera at infinity by focusing on some object around 500 feet away. Use a magnifying glass to make sure of your sharpness. The ideal lens setting with an f.4:5 lens at 500 feet is f.8 at a shutter speed of 1/300 of a second. At 700 to 1,000 feet set your camera at f.11 at a shutter speed of 1/200 of a second. These figures are for use with a filter of medium density. Should no filter be used, the lens can be closed down one additional stop.

Film packs are recommended as they work smoothly, are fast and not too expensive. The speed of the airplane is of small importance as the exposures given will easily overcome it up to 70 or 80 mph. However, the most important thing to guard against is camera movement. This can be caused by holding the camera loosely, engine vibration, wind blasts, or vertical movement of the airplane. Always guard against this. The camera should be held *firmly with both hands*, with all parts of the body from the waist up free from any contact with the airframe. With all these factors taken into consideration, one holds the camera with eye on sight waiting for the object to be photographed to appear in the center of the view finder. When the object is "framed," squeeze the release gently—and you've got a first-class picture.

If you are an amateur camera fan, you'll probably rush to your darkroom to see what you've got. However, I find most any commercial laboratory will do your processing expeditiously and reasonably, their facilities and abilities being of the best. It is well to first have the film just developed. Then, after careful scrutiny, determine what part of the negative you want to have printed. It is rare that an entire negative will be used, but instead you will mask out portions unwanted. As to prints, because of the tremendous amount of fine detail, it is desirable to have 8 x 10's or larger made. Six or eight such pictures mounted in an album make an excellent presentation that will be treasured. Size 16 x 22 framed on any wall invariably commands great interest, and you'll get many a job because the prospect saw his friend's album or his wall picture that came out of your camera. Go ahead—try it.



Marine Bees

A Marine Corps Grumman *Panther* parked on the ramp at Roosevelt Roads in Puerto Rico recently was chosen sitting place for a swarm of bees. Thousands of these winged attackers not only covered the nose of the *Panther* but also covered the inside of the jet ship, a honeycomb surrounding the queen bee. An hour's work finally cleared the deck.

New Beech Bonanza

(*Continued from page 46*)

Ranch strip—10 minutes by *Bonanza* but an hour by car over the coastal ridge.

"Be sure and land in the middle of the runway," advised Mr. Bundy as we climbed over the 3,000-foot Santa Ynez range in a drizzly rain. "I just talked with Mr. Crawford on the phone and he says that there are some bad gopher holes on the sides of his strip."

In practically no time at all we were over the San Lucas strip—2200 feet long and about 50 feet wide. The field is ringed by high hills and the wind was gusty but the wind sock adjoining the hangar was hanging limp. That should have made us suspicious.

We circled once, dropped the gear and swung into a normal westerly approach from a tight right-hand pattern. We laid our base leg too close to the field and, even with the greatly improved flaps, we were still turning 90 mph when we came across the giant oak trees surrounding the airport. The wind picked up about this time and we were well into the middle third of the field without yet touching the ground.

"Let's go around," said Mr. Bundy at about the same time we poured on the throttle.

Then we found out that the gear and flaps will come up together on the new *Bonanza*. This high-speed retracting mechanism came in mighty handy as we poured on full throttle and climbed out away from the farming strip.

We went out about three miles, made a 180° turn and came in for a "back-door" landing without any trouble.

As we taxied up to the hangar, we could see the wind sock wrapped around its pole by the gusty wind so that it did not indicate the 20- to 30-mph blast that was now whistling through the tree tops. No wonder we overshot the airport!

It was late in the afternoon by the time we returned to Goleta and drizzly rain clouds covered the area. We topped the gas tanks and scurried back to Monrovia.

We rode home in the back seat. If you are extremely long legged, the *Bonanza's* back seat can be a little tight but there's plenty of room in the front seat for the longest set of legs.

While it didn't happen on this trip, it is doubtful if there has been a *Bonanza* built that at sometime or other someone hasn't taken off with the door only partially locked. If the handle is not fully secured, the door will pop open about four inches just as the ship becomes airborn. It doesn't open farther because of the pressure of the slipstream, but it is next to impossible to lock both latches in flight because of the air pressure that builds up in the cabin. The only sure-cure is to land and shut the door securely. With the complete and elaborate electrical system on the *Bonanza*, it should seem to be a simple matter to wire an indicator light somewhere on the panel that would show when the door was not shut and completely locked.

Another little wrinkle that might add to this ship is a flange on the ignition key so that a pilot can be completely sure that his switches are off before he leaves the airplane. The engine is stopped with an idle cut-off on the mixture control and many a pilot has shut off his engine that way and then forgotten to cut his switches. A flange on the key would be an added reminder of the direction in which the key was pointing.

The new propeller installation works out wonderfully well. However, the wiring to the prop is not tied in a loom as it comes over the top of the motor. Undoubtedly the system is completely satisfactory, but purely from a salesmanship standpoint, it would seem more complete to put all the proper wires in a single shielded line.

Incidentally, this constant-speed prop is available as a conversion kit (cost $300 plus installation) for older model *Bonanzas*. However, it is not possible to up the horsepower by adding rpm's because of other numerous engine modifications.

The lowering rain clouds dissipated into a dirty layer of smog over Los Angeles as we let down into Monrovia. King Williams, who flew the return trip, missed his own airport by half a mile because of the restricted visibility—but a pilot must expect such things in Southern California these days.

"There are three things that I don't allow in my sales organization," said Mr. Larson as we circled over the airport. "As long as a pilot works for me, there'll be no acrobatics, no instrument flying and no night flying in any single-engined airplane. I don't mind if a pilot gets home just at dusk or a few minutes later—just as long as he's pointed toward his home airport when the sun goes down."

There was just enough sunlight for Mr. Larson to get back into Burbank without breaking any of his own rules.

For a pilot who wants a complete airplane with plenty of cross-country speed and comfort, this new B35 *Bonanza* is a sweetheart. It looks well, flies well and is certainly efficient.

Chronograph Wrist Watch

LOWEST MARKET PRICE $7.25

Sweep Second Hand; Precision Workmanship; Rugged Shock-resistant case; Radium hands and numerals; Leather strap. It measures distance, speed of cars, planes, horses and other moving objects. It's a time keeper, stop watch, telemeter, tachometer. ONE YEAR WRITTEN GUARANTEE and full operating instructions enclosed with each watch. SEND NO MONEY. Mail your order today. Pay postman $7.25 plus 10% Federal tax. Total $8.00 plus postage. Or send cash (money order or check) with your order and save postage charge.

MARDO SALES CO., Dept. 3703
480 Lexington Ave., N. Y. 17

ENGINEERING DEGREE IN 27 MONTHS

INDIANA TECHNICAL COLLEGE

ENGINEERING: B.S. DEGREE IN 27 MONTHS. Aeronautical, Chemical, Civil, Electrical, Mechanical and Radio Engineering (inc. television). Drafting. 1-yr. Gov't approved for G.I.'s. Low rate. Earn board. Large industrial center. Students from 48 states, 18 countries. Demand for graduates. Enter June, Sept., Dec., March. Write for catalog. 250 E. Washington Blvd., Fort Wayne 2, Indiana.

IF YOU MOVE . . .

Send change of address to

SKYWAYS

HENRY PUBLISHING CO.

444 Madison Avenue
New York 22, N. Y.

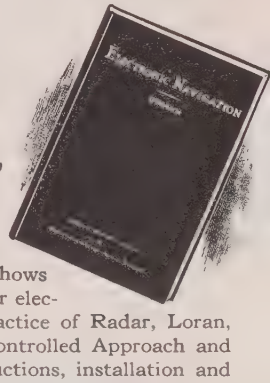
at least 6 weeks before the date of the issue with which it is to take effect. Send old address with the new, if possible send your address label.

Copies will not be forwarded by the postal service unless you supply extra postage.

All Pilots Will Want This Useful, New Book

"ELECTRONIC NAVIGATION"

by Lieut. Col. L. M. Orman, U. S. Army



An indispensable aid for the modern navigator. Tells and shows in 213 authoritative pages how to get the most out of your electronic navigation equipment. Gives you theory and practice of Radar, Loran, Consol, Decca, Instrument Landing Systems, Ground Controlled Approach and other systems of electronic navigation. Operating instructions, installation and maintenance procedure included. The first and only book of its kind. Get your copy at book stores, your aviation supply dealer, or order direct by sending check for $4.50 to address below.

Other Weems Navigation Aids You May Need

Weems Mark II Plotter—$2.00
Dalton E-6B Computer—$10.00
Dalton Mark VII Computer—$5.00
Instrument Flying, Weems & Zweng—$4.50
Air Navigation, Weems—$3.75
Practical Manual of E-6B Computer—$2.00

"SEE YOUR AVIATION SUPPLY DEALER"

Address Dept. 21, Weems System of Navigation
Annapolis, Maryland

Weems Air Navigation School

Est. 1927. Resident and Correspondence Courses. Write for details. Enrollment approved under G. I. Bill.

AIR WSN WEEMS SEA SYSTEM OF NAVIGATION
ANNAPOLIS, MARYLAND

Flights Of A Farmer

(*Continued from page 29*)

the harvesting machinery he'd developed. The next morning he winged his way back to California and home, his eight 50-pound sacks of Ranger seed in the back of the plane and a notebook filled with new ideas in his pocket.

Pilot Henning got home with his cargo just in time for planting. Another two days and he'd have had to wait until the fall of 1950 to plant the seed he'd flown to get.

A few days after the alfalfa seed had been put in the ground, Henning was up and away again. This time to the University of Nebraska at Lincoln to investigate Safflower seed, a new oil seed crop which is taking the place of linseed as a drying oil in paints.

Getting away from his own extensive farm operations to learn new methods used in other parts of the country is not a recent Henning undertaking. Ever since he bought his first *Navion*, about four years ago, he's been seen more in the skies than on the ground.

As Henning himself put it in expressing the utility of his airplane, "I needed a weed burner that was hot enough to burn weed seeds on contact. When I heard about one being used by the railroads in the East, I found out it was built in Minneapolis. My wife and I flew the *Navion* to Minnesota, looked the weed burner over, decided it was exactly what I wanted and had one built and sent out to Tehachapi.

"With that taken care of, we flew to Florida to have a look at the competitive potato producing districts there, and then went on to New Orleans where I bought three strains of hybrid corn seed to try in California.

"Last April there was some up-to-date information on apple orchards that I wanted, so I took the *Navion* to Santa Rosa in the morning, spent the day with the growers there discussing insect control, irrigation methods, pruning, etc., and was back home with the ship in the hangar before nightfall.

"In September the corn I had bought in New Orleans had grown up and I wanted to see the latest corn harvesting and shelling equipment. So one morning after visiting my Bakersfield ranches and going to my office, I flew to Stockton. Arriving at noon, I was met by the grain buyer for Ralston Purina Corporation, who took me to the best growers in the area. In addition to seeing this automatic harvesting equipment, I was able to get information firsthand on proper seed spacing, cultivating, frequency of irrigation, insect control, growing costs, harvesting costs and last, but not least, net returns per acre.

"Another good example of the value of my plane concerned Ramie, a fiber plant previously grown only in Egypt. The only decordicating machine in existence to handle Ramie and the only field of Ramie in shape to harvest after the New Orleans hurricane, was at Atmore, Alabama. Another farmer and his wife, and Mrs. Henning and I flew to Atmore, Alabama. We saw the Ramie growing and saw it harvested. We learned about its growing habits, what kind of soil it liked, what fertilizers to use, how often to irrigate, when to harvest and what insects liked Ramie best. We learned this all in one day and then flew back to New Orleans.

"From New Orleans we made a short hop up to Clarksdale, Mississippi. There we visited the King-Anderson plantation where a large implement manufacturing company, Allis-Chalmers Mfg. Co., had been experimenting with and developing a mechanical cotton picker. We had a private preview of a machine doing the slickest job of picking cotton we'd ever seen, and after crawling over the machine, under it, into it, walking in front of it, behind it, beside it and driving it, we placed the number one and two orders for Kern County, California.

"Last summer I was confronted with a weed problem in my potatoes after the plants were too large to cultivate. A new selective weed spray, called 2-4D, was supposed to kill any broad leafed plant. I had heard that Dr. Baake of Iowa State College at Ames, Iowa, had been doing some research work with 2-4D on potatoes.

"My son, who is 13, and I took off for Iowa State College. Bill always takes over whenever I feel a siesta coming on. I've slept an hour or more at a time and never awakened to find him off course or at another altitude.

"After an over-night stop, we arrived at Ames at noon the following day. We spent the afternoon with Dr. Baake getting the benefit of three years intensive research.

"The next morning we took off from Ames, lunched in Omaha and slept in Cheyenne that night. The next afternoon we were home. After engaging an airplane spray rig for the following morning, I found that the particular form of materials I needed were not available locally. With just enough time left to telephone, I located the materials in Fresno, California, 100 miles away. The engine in the *Navion* wasn't even cold when I took off for Fresno. Ninety minutes later I had my eight 5-gallon cans of spray material on the runway for the spray rig. I made it home in time for dinner.

"Yes sir, every time I've made a trip in my airplane, it has produced dividends. My first *Navion*, built by North American, was delivered to me on December 21, 1946. After 865 hours and 32 minutes in that one (NC91495), I traded it for a Ryan-built *Navion* which was delivered to me on September 2, 1949. This present ship already has 72 hours and 21 minutes on it.

"As far as cost is concerned, I really haven't much on the new one, but 91495's cost figures stack up fine. With a total time of 865 hours and 32 minutes, the operating costs per hour average out at $14.12. This includes three years' operations—gasoline, oil, repairs, hangar rent and tie-down, extra instruments, compliance with all bulletins, insurance, depreciation and taxes. On a cost per seat mile basis, it ran $.0252.

"My flying began a few years ago in an Aeronca *Champion*, which I soloed after the customary eight hours. As far as forced landings are concerned, I've had three—two in an Aeronca and one in a *Swift*. My first F.L. is one I'll remember a long, long time.

"I took off in an Aeronca for my fourth solo hour just before sundown on the evening of May 30, 1946. My *Navion* had been ordered, was scheduled for delivery in August and I was anxious to get my license and build up at least 50 hours before getting the ship. No one was going to fly my *Navion* away from the factory—that was for me, definitely! On clearing the runway and with about 100 feet of altitude, I was just ready to move the throttle back off of full when my pants told me we were not climbing as fast and my ears told me the engine was losing revs.

"I would like to get into the record now, that from this point on until I landed one stick of chewing gum took the greatest beating in the history of gum.

"I chose my spot for the forced landing but was soon running out of field and there was no more time for dodging. Just then the wheels touched in the best three-point landing of my short career. The soft dirt slowed the ship just enough so that when the wheels hit the soft mud, the ship was going too slowly to nose over. I had made my landing and had 10 feet of field left, thanks to that mud. Needless to say, I got out in record time, cutting the switch on the way.

"Perhaps its all right to compliment ones self in a case like that if there is no one else around. Anyway that is what I was doing. No damage to the airplane and I was walking away. Perfect!

"Landings in my *Navion* are perfect, too. It's easy to handle and fun to fly. Mix that with profit from its use in business and you can see why my airplane is important to me and to the hundreds upon hundreds of other ranchers and farmers who fly."

RYAN NAVION for 1950, one of three new models, is this *Navion* Deluxe 205. Important improvement is the installation of manually controlled engine cowl flaps as standard equipment

Life Line to Everywhere

(*Continued from page 47*)

and the flight engineers, T/S Ciliberti and S/S Pennington. We talked about equipment, and I learned that MATS operates quite a diversified fleet at the present time, but that a program of standardization, with emphasis on larger aircraft, is well under way. There are some 900 aircraft of 20 types now in MATS operation. The majority of types meet the specialized requirements of MATS Airways and Air Communications Service, Air Weather Service, Air Rescue Service and Flight Service, the indispensable route-support organizations that make MATS transport operations possible. MATS transport fleet include several hundred C-54's (R5D's) and C-47's, the World War II workhorses. Of newer types MATS operates five huge C-74's and nine C-121 *Constellations*, with Boeing C-97A's now in use in the Transport Training Unit of Continental Division. The Douglas C-74 is a forerunner of the production C-124 strategic air-cargo plane. The boys confirmed my own long felt conviction that we ought to be building these long-range high-capacity air freighters (C-124, C-97 A & B) by the hundreds instead of by the handfuls. If trouble strikes suddenly (and that's the only way it will strike in the air age), we are going to have to fly terrific tonnages of materiel and tens of thousands of personnel to hold the line.

Lt. Boyne gave us a brief account of the Air Rescue Service operated by MATS. It appears that this too is now on a world-wide basis. About a dozen rescue units are located in the United States, Alaska and Canada, and as many more in the North and South Atlantic, Europe, Middle East and the Pacific. Equipment includes B-29 and Search-B-17 airborne lifeboat carriers, C-82's, liaison planes, amphibians and helicopters. Ground equipment includes jeeps, radio-equipped trailers, trucks, etc. An arctic rescue helicopter of advanced design, developed by Piasecki, is under contract construction now.

Lt. Young proceeded to tell us about the far-flung Air Weather Service which provides global meteorological services to the Air Force and Army and other allied services as may be designated. There are more than 9,000 men operating fixed, mobile and airborne weather units throughout the northern hemisphere. The Service naturally functions closely with the U.S. Weather Bureau and Naval Aerology. A dramatic example of its efficiency was found in the 'round-the-world flight of the "Lucky Lady" (B-50) about a year ago.

The radio operators, S/S Caplon and T/S Hoke, explained their operation, then reported that as far as they knew MATS had at least one organization that was really unique. This is the Airways and Air Communications Service, whose world-wide facilities make up a pattern of air routes almost as definite as though they were connected by roads or rails. The AACS provides communications and navigational aid facilities, including air traffic control, for the safe movement of military aircraft. It also cooperates with ICAO and other agencies working toward the development of a common world-wide airways and electronic air-navigation system.

S/S Caplon said that last year there were some 20 million control tower contacts throughout the system and nearly 250,000 GCA radar precision approaches. There are more than 16,000 men employed at nearly 200 operating locations.

Going back to the cabin, I had plenty to think about. Here was an operation which had endless possibilities for development of world understanding and cooperation.

Among my fellow passengers was a State Dept. official headed for Vienna. Several GI wives and their children were along and this emphasized what a notable job MATS is doing to improve morale among our boys in foreign lands and to help them to lead normal lives.

Our flight was scheduled as non-stop to Rhein-Main, but somewhere after the half-way point headwinds developed, and we stopped to refuel at Orly Field, Paris, getting weather checks, etc. as we approached within a couple of hundred miles of that base. Elapsed time for the flight from Westover to Paris was almost exactly 12 hours. We found we had lost about a quarter of a day, however, as it was 0500 (5 a.m.) Paris time, instead of 2300 (11 p.m.), as indicated by my as yet unadjusted watch. A few hours later and we were in Rhein-Main, focal point of the spectacular Operation Vittles in which MATS had such an important share.

From there on I was busy meeting scores of MATS and Air Force personnel, arranging for stories, getting photographs, and becoming more and more impressed with the contribution our country is making toward the rehabilitation and stability of western Europe.

One of the trips I was able to make was a flight to Rome. This was in a C-54 which completes a twice-a-week schedule between Rome-Athens-Tripoli. We passengers were a pretty cosmopolitan lot—Americans, Britishers, French, Italians and a half dozen flyers of the Greek Air Force.

While I didn't get that far, I did hear some people talking about Dhahran, Saudi Arabia. This is where MATS' Atlantic and Pacific divisions clasp hands, and is an outstanding example of how MATS operates to keep U.S. air power alive in crucial areas. A few years ago nobody paid much attention to such an out of the way place as Dhahran, but today it is a strategic spot, a world crossroad of the Air Age.

Return trip from Rhein-Main to Westover was made by way of Iceland in a 40-passenger *Constellation* piloted by Lt. Wagner. His co-pilot was Lt. Groblewski, and his navigators were Lts. Moore and Sherrill. Other members of the crew were T/S Poulin, M/S Malukonis, S/S Vose, T/S Devine and Cpl. Doulette and Sgt. Coppolo. We had a few hours' stop-over at Keflavik Air Base, Iceland, where Lockheed Aircraft Service keeps things moving for the commercial airlines, and includes a fine hotel among its properties. Among our fellow passengers were a number of GI's whose "expectant" wives had been flown State-side some weeks earlier. This policy of flying home mothers-to-be coupled with the general policy of flying all cases of serious illness back to the U.S. in a matter of hours from any part of the northern hemisphere is one which is highly appreciated by our boys overseas.

On the return journey we heard some more about a subject that had come up from time to time at various points in our trip—MATS' drive for economy, a continuing goal to lower operation costs and raise efficiency in the various organizations. Concrete examples of how MATS installations are meeting this challenge are flowing in from all over the world, and are published from time to time in the various divisional newspapers.

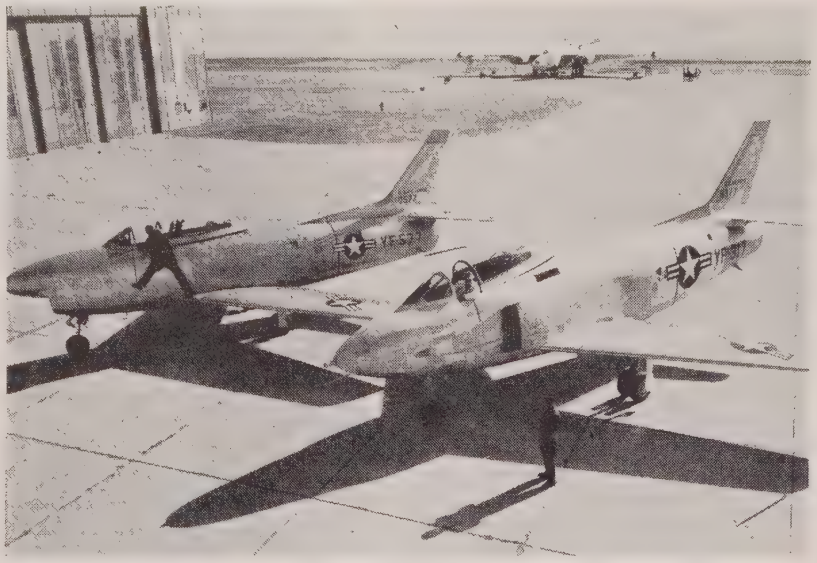
By designing a new jack for tightening ropes on aircraft tie-down cargo, a Pfc. of the 1600th Air Traffic Squadron has saved the Air Force an average of $650 per month since July 1949.

A final impression, I saw a practical demonstration that service unification—possibly "operational integration" would be a more accurate phrase—can be made to work. Although on an Air Force mission, I had many an opportunity to see and hear of the fine work carried on in MATS by Naval personnel, and by Army troops, too. In this we see great hopes for the future welfare of our country.

BEST BUY UNDER THE SUN!
U. S. Army Air Force Type
SUN GLASSES
Men's and Women's sizes

FORMERLY $8.50 VALUE
Sensationally Priced at only... $1.88 postpaid
★ Cool green meniscus curved, polished lenses.
★ 24 Karat Gold Plated adjustable frames
★ Pearloid Sweat-bar and Nose-pads
★ Reinforcing bar for greater durability
★ Lenses meet specification of U. S. Gov't. Bureau of Standards.
LIFETIME GUARANTEE
Included with every pair of glasses
10-DAY TRIAL • MONEY-BACK GUARANTEE
MAIL THIS COUPON TODAY!
CHICAGO GOGGLE SALES CO., Dept. 214
20 E. Delaware Pl., Chicago 11, Ill.
Please send me....Men's....Women's Sun Glasses.
☐ Send C.O.D.
☐ Enclosed find $..... Mail Postpaid.
Name.....
Address.....
Town..... State.....

Buy
U. S.
SECURITY
BONDS
Now



NORTH AMERICAN'S latest Air Force fighters are paired off here in front of a B-45. The YF-86D *(left)* is high-speed interceptor; YF-93A is penetration fighter

Alaska to Norway

(*Continued from page 23*)

far as you can see, with some open leads here and there. Due to bad weather, much of our route kept us in or above the clouds.

We reached the northernmost point on our trip around Ellesmeres Land—about 80° North or about 10° from the Pole—a distance of approximately 1600 nautical miles from Fairbanks. Here the temperature was 31° below, but the heaters in the plane worked fine and we were all quite comfortable. The weather was rough from Ellesmeres Land and past the northern part of Greenland where we passed through a cold front. But we were making good speed anyway, thanks to the tailwinds.

During the night we flew over the northeastern part of Greenland, passing about 15 miles north of Jan Mayen. Around 11:30 A.M. Norwegian local time, we spotted the Norwegian coast on our radar and flew in over Möre, not far from the village of Molde. We followed the valley Gudbrandsdalen south to the city of Lillehammer where we turned south and passed over the Gardermoen airfield at about 6,000 feet. The weather in Oslo was not good, low clouds and fog practically blanketed the area. However, we wanted to investigate the chances of making a landing at Fornebu airfield in order to arrive at the airshow on time, so we flew south after Gardermoen and on to Oslo and Fornebu, staying in the clouds until we were a short distance out over Oslo fjord. Our radio compass in our plane was not functioning, and this made it impossible for us to make a let-down at Fornebu, so we backtracked to Gardermoen and made a normal let-down there. When we rolled to a stop, we'd been in the air exactly 22½ hours and we still had enough gas for about another two hours' flight.

We were soon picked up in a DC-3 from my old Airline, D.N.L. by the American Air Attaché to Norway, Major Dale Jensen, and arrived at Fornebu about 4:00 P.M. It is interesting to note that this flight was the longest ever made by a C-54 and we had flown a distance of 3,980 statute miles. Except for minor radio compass trouble over Fornebu, the plane, instruments and engines, functioned beautifully all the way.

From a training point of view, this trip was most useful and instructive. Over the northern areas we used grid navigation aided by radio bearings. Over the Polar basin, magnetic instruments are not reliable. Therefore our grid headings were determined by Astro compass, radar and gyro instruments. We flew directly over the magnetic Pole, where the magnetic compass is of no value to the navigator.

The trip itself was routine. We all took turns piloting. General Armstrong was also at the controls for a while. During such a trip, you have to pay a lot of attention to navigation, and our navigators had their hands full most of the time. I certainly want to give them credit for the excellent job they did because it takes skill and experience to navigate in such areas.

The radio connections with various weather and observation stations in Alaska and Canada were excellent, although we did miss picking up a lot of information that would have been of value to us on the trip across the North Atlantic. We made practically no radio contacts with Norway, and had to depend on our own calculations. This is not to be construed as a criticism, but merely as a proof of the desirability of better radio cooperation in these areas, a cooperation that would be valuable to us all.

It's the job of the 10th Rescue Squadron to go out on relief missions at any time and anywhere in the arctic regions, and we have to face the possibility of having to go on missions close to other nations near the Polar basin, like Norway, for instance. In such cases, cooperation will be invaluable. That is why this trip was so important. Our C-54 has chalked up a new first, but it won't be the last.

Sky Cops

(*Continued from page 17*)

promptly placed with Ragsdale for purchase of the *Navion.*

In the short period that the Department has had it in service, the plane has been successfully utilized in transporting laboratory technicians to crime scenes (no small matter in the broad stretches of the Lone Star State where distances are extremely great) and in mapping aerial traffic surveys for a study in outlining traffic enforcement programs in the more thickly populated sectors of the State. During a Texas-Texas A & M Football game at College Station, Joe S. Fletcher, Assistant Director of the Department, took to the air with Ranger Max Westerman at the controls and worked the heavily congested traffic arteries from above, keeping in constant contact with the Highway Patrol cars on the ground via the Department's regular FM channel and dispatching them to "trouble spots" in matters of minutes. A steady flow of traffic was thereby maintained both to and from the game. The vast improvement in traffic conditions, thanks to the airplane, was commented on editorially in at least one of the State's larger daily newspapers. This use of the airplane has proved itself on many occasions . . . and many of the states that operate aviation departments are counting traffic surveys by air as one of the airplane's most important jobs. The Texas Rangers undoubtedly will be doing more and more of this sort of thing now that the group has its own *Navion.*

Utilizing still another type of aircraft in the execution of their duties, Headquarters Company of the Texas Rangers recently staged a gigantic round-up of livestock on the 200,000-acre military reservation at Camp Hood in Central Texas. The Army placed a helicopter, complete with pilot, at the disposal of the Rangers and the job of locating strays in the hills and dry gulches was reduced from a man-and-horse-killing task to a pleasant and agreeable chore.

The Department's *Navion,* dubbed of course "Texas Ranger," was chosen for police service because of its sturdy adaptability to small landing strips and rough flying conditions. With a cruising speed of 150 mph the plane is fully equipped for instrument flying and with FM radio receiver and transmitter for plane-to-car, plane-to-station and vice versa contact. It is adapted for use as an ambulance plane and will doubtlessly prove invaluable in transportation of drugs, serums and injured persons in event of disasters.

Ranger Max Westerman, regularly assigned as pilot of the craft, is a veteran flyer with over 3,000 hours on his log book. He flew prior to World War II and during the conflict served successively as an Army Cadet Instructor, a member of the 5th Ferry Group, and as a flyer overseas in Africa and China. During a year of herding C-46's in China, he made 15 trips over the "Hump" and numerous other front-line flights. He holds a Commercial License and Instructor's Rating.

Texas is a lot of country to police with only one plane but it's a start and, anyway, the Rangers still operate under the old theory of "One riot—one Ranger." Maybe now they'll add to it—"One riot—one Ranger—one Airplane."

Strike Fighter, F-90

(*Continued from page 43*)

The next day I took the same ship up on dive test and happened to look out at his fillet just as I was pulling out of the ive. It was bowed way out of shape by the ir sucking it away from the wing.

After landing, I asked a crew chief to ut a heavy strip of metal over the top of his fillet on each side of the fuselage, and se cherry rivets to anchor it. I took the ship p again and it handled perfectly. Within wo days there was a simple modification kit nder construction at the factory and all hips that came off the line after that had his section "beefed up."

It was just a damn little piece of metal, ut it took a lot of flight testing to find the law and correct it.

It's quite a sensation to get that big F-90 p and turn her loose. It's quiet and, like nost other jets, the noise all goes out the ail pipe. Visibility ahead is perfect but you an't see much of that airplane following ou except the outboard end of the wings. The rear-view mirror shows the rudder and he high-level tail group. If the tip tanks are board, they are plainly visible. These drop anks reduce the top speed only about 5 er cent. Incidentally, the F-90 is the only wept-wing fighter capable of using wing-ip fuel tanks.

The F-90 has automatic wing slats. These ull-floating, leading-edge slats (formerly alled "slots"—actually the "slats" create he "slots" in the leading edge of the wing) ncrease the lift coefficient at slow speeds nd make the fighter flyable at a greater ngle of attack than normal. It smooths out he airflow and prolongs aileron control at low speeds. Since all sweptback wings have tendency to tip-stall, these slats are a reat help.

At this writing, Herman "Fish" Salmon nd I are the only two pilots who have flown the F-90. As director of the flight test ilots at Lockheed for the past five years, have the responsibility of either flying a ew model or assigning it to another pilot on ur payroll. I like to fly as many of these ew models as I can. After all, that's my ob. Not only do I make the first hop, but fly these prototype models a good many imes thereafter—to make damn sure that hey're all right. That's why I was the ne to take up the Air Force's first combat et aircraft—the XP-80A *Shooting Star*, with General Electric I-40 engine.

When the F-90 project came along, some-ne asked Kelly Johnson who was going to ly it. He said, "Ask Tony LeVier." So I figured that it was okay for me to go ahead nd make the first flights. No one in the front office said anything about it.

Without stepping out of line on security problems, I can say that the F-90 is a damn fast airplane. The design is clean and Lock-heed has built plenty of "beef" into the airplane. It's built as a penetration fighter whose mission is the destruction and dis-ruption of military targets and activities far behind actual battle lines. On a job like his, the F-90 would rely on speed and maneuverability to stay out of trouble.

That's what she was designed for, and from a pilot's standpoint, that's what she will do.

If you are a . . . PILOT

STUDENT PILOT

CAP MEMBER

PLANE MEMBER

Are you one of the air-minded individuals who wants to keep abreast of aviation developments? Then SKYWAYS is a natural for you—a "must"—for it is the dominant aviation magazine among all the leaders of the field.

SKYWAYS is *edited* for *airmen*, if you are not getting SKYWAYS regularly, you should do something about it today.

We'd like to make sure that you get your copy of SKYWAYS right on time every month. Here's a special offer we hope you act upon right now.

You are invited to subscribe to SKYWAYS, for a limited time only, at the special low rate of only $2.00 for 1 year, $3.50 for 2 years and $5.00 for 3 years. It's your best buy for complete news coverage of everything that flies. You can't afford to be without SKYWAYS . . . take advantage of this special offer—subscribe today!

Please clip and return

HENRY PUBLISHING CO., 444 Madison Avenue, New York 22, N. Y.

Please check: New Subscription ☐ Renewal ☐

I enclose $_____ (No billed orders) Start _____ Issue

NAME _____

ADDRESS _____

CITY _____ ZONE _____ STATE _____

Are you a PILOT ☐ PLANE OWNER ☐ CAP MEMBER ☐

License No. _____ Make _____ Wing No. _____

If you change your address, notify us. SKYWAYS will follow you wherever you go.

Add $1.50 per year for postage to other countries, except Canada and Pan Am. Union.

5-50

★ CLASSIFIED ADVERTISING ★

SKYWAYS' CLASSIFIED ADVERTISING RATES ARE 8c PER WORD—FIRST 15 WORDS (MINIMUM SIZE) $1.00

USED PLANES WANTED

POWERS & GEORGE, Aircraft Brokers, of 475 Fifth Avenue, New York City; and 505 North Ervay, Dallas, Texas, have purchasers for all types of aircraft. No charge for listing your ship for sale. Write for details, describing your airplane.

REYNOLDS AIRCRAFT BROKERS of Raytown, Mo., have purchasers for all types of aircraft. No charge for listing your ship for sale. Write for details describing your airplane.

WANTED NAVION, LATE RYAN. Must be bargain for cash. Give full details in first letter. M. Carmichael, 545 6th Avenue, Pittsburgh 19, Pa.

PROGRESSIVE AIRCRAFT BROKERAGE will sell your airplane. No charge for listing. Write for details, describing your airplane. Madden Aircraft Brokerage, 211 North Longview, Dayton 3, Ohio.

USED PLANES FOR SALE

AERONCA

SEDANS: 8 available from $2875. 1949, #1367HS, has 65 hours. Zero time guaranteed engine. Radio. Loop. Heater. New condition. $3300. Make offer. Inquire, POWERS & GEORGE, Aircraft Brokers, 475 Fifth Avenue, New York City; or, 505 North Ervay, Dallas, Texas.

BEECH

BONANZAS: 51 available from $5500. September 1948, A-35, #794BS, has 310 hours. Full gyros. VHF radio. Omni-range less indicator. Sun visors. Curtains. October license. Beautiful. Asking $8000. Offer wanted. Apply, POWERS & GEORGE, Aircraft Brokers, 475 Fifth Avenue, New York City; or, 505 North Ervay, Dallas, Texas.

D-18-S TWINS: 10 available. Corporation owned executive, #81168S, has 209 hours since engines overhauled. Nose tank. Gyros. ADF. Beautifully appointed. Excellent condition. $27,000. Inquire, POWERS & GEORGE, Aircraft Brokers, 475 Fifth Avenue, New York City; or, 505 North Ervay, Dallas, Texas.

STAGGERWINGS: 9 available. D-17-S, #1315MS, has 306 hours, and engine 21 hours since overhauled. Fabric and paint excellent. New propeller, Gyros. Radio. Loop. Relicensed. Exceptional. $4000. Apply. POWERS & GEORGE, Aircraft Brokers, 475 Fifth Avenue, New York City; or, 505 North Ervay, Dallas, Texas.

BEECH TWINS: 5 available from $17,500. Spartan overhauled plush long nose conversion. New P & W's. ILS, VHG, etc. Asking $19,225. Madden Aircraft Brokerage, 211 North Longview, Dayton 3, Ohio.

BONANZAS: 14 available from $5,500. 1947 model 35, 162 hours, clean, $6,550 asked. Madden Aircraft Brokerage, 211 North Longview, Dayton 3, Ohio.

BELLANCA

CRUISAIRS: 20 available. All years. 1947, #75302S, has 350 hours. Small fins. Outside baggage door. Fabric and paint excellent. Primary blind instruments. Radio. All bulletins. Clean. $2750. Inquire, POWERS & GEORGE, Aircraft Brokers, 475 Fifth Avenue, New York City; or, 505 North Ervay, Dallas, Texas.

CESSNA

140'S: 1946, #80460S, has 399 hours; 226 on new engine. Metal propeller. Dual brakes. Primary blind instruments. Mixture control. Radio. All bulletins. Clean. $1200. Also, 1947, #2085NS, with 105 hours. Metal propeller. Landing lights. Mufflers. Control lock. Primary blind instruments. Radio. September license. $1800. Apply, POWERS & GEORGE, Aircraft Brokers, 475 Fifth Avenue, New York City; or, 505 North Ervay, Dallas, Texas.

ALL CLASSIFIED ADVERTISING

accepted with the understanding that it will be placed in the first issue closing after receipt of order. Classified forms close first of second month preceding date of issue.

All Classified Advertising Prepaid

CESSNA 170: 7 available from $3,900. 1949 model, 63 total hours, equipped with crosswind gear, other extras. Excellent. $5,975. Madden Aircraft Brokerage, 211 North Longview, Dayton 3, Ohio.

CESSNA 195: 2 available. 1948 model, 240 hours, $11,000 asked. Madden Aircraft Brokerage, 211 North Longview, Dayton 3, Ohio.

170'S: 35 available. 1948, #3910VS, has 22 hours. DeLuxe equipment. Hangared. $3800. Also, 1949 all metal, #9257AS, with 188 hours. Fully equipped. February license. New condition. $5150. Inquire, POWERS & GEORGE, Aircraft Brokers, 475 Fifth Avenue, New York City; or, 505 North Ervay, Dallas, Texas.

195'S: 9 available. 1948, #3582VS, has 388 hours. Gyros. ARC VHF radio plus standard. ADF. Other extras. $10,000. Also, 1949. #4485VS, with 290 hours. Gyros. ADF. Flares. New condition. $11,000. Offers wanted. Apply, POWERS & GEORGE, Aircraft Brokers, 475 Fifth Avenue, New York City; or, 505 North Ervay, Dallas, Texas.

TWIN CESSNAS: 32 available. #55532S, has recovered wings and tail. Engine time since major 266 and 370 hours. Gyros. Flares. ADF. Extra tank. Licensed. All bulletins including tanks and spar. Bargain. $1125. Inquire, POWERS & GEORGE, Aircraft Brokers, 475 Fifth Avenue, New York City; or, 505 North Ervay, Dallas, Texas.

ERCOUPE

ERCOUPES: 79 available from $850. 1946. #2070HS, has 185 hours. Metal propeller. Two-way radio. December license. $1000. Also, 1947, #95721S, with 140 hours. Metal propeller. Radio. Loop. $1300. Apply, POWERS & GEORGE, Aircraft Brokers, 475 Fifth Avenue, New York City; or, 505 North Ervay, Dallas, Texas.

FOR SALE: 1946 ERCOUPE, N.C. 99899, top condition, always hangared, two-way Firestone radio, sensitive altimeter, all bulletins, just completed 100 hour check. Only 320 hours. A good buy at $1100.00. P. O. Box 3071, El Paso, Texas.

GRUMMAN

GOOSE AMPHIBIANS: 6 available from $30,000. #60274S, flown 70 hours since completely rebuilt. New engines, interior, ADF, automatic pilot. De-icing piping. Beautiful. $33,500. Inquire, POWERS & GEORGE, Aircraft Brokers, 475 Fifth Avenue, New York City; or, 505 North Ervay, Dallas, Texas.

WIDGEON AMPHIBIANS: 23 available from $7625. Late G-44-A, #87656S, has 233 total hours. Curtiss metal propellers. Special radio. Loop. Gyros. Relicensed. Grumman maintained. Exceptional. $16,500. Apply, POWERS & GEORGE, Aircraft Brokers, 475 Fifth Avenue, New York City; or, 505 North Ervay, Dallas, Texas.

HOWARD

DGA-15-P'S: 17 available. #1418MS has 250 total hours, engine 700, 250 since major overhaul. Gyros. ARC radio. Relicensed. Hangared. Good condition. $1850. Inquire, POWERS & GEORGE, Aircraft Brokers, 475 Fifth Avenue, New York City; or, 505 North Ervay, Dallas, Texas.

HOWARDS: Excellent 1944 model, P & W 450, Hamilton propeller, new paint. ADF plus complete radio. Clean. $1,900. Others. Madden Aircraft Brokerage, 211 North Longview, Dayton 3, Ohio.

HOWARD DGA-15P in fine condition. Five place. Equipped with A. D. F. and marker beacon. New deluxe upholstery. Less than 500 hours on air frame and engine since new. Make reasonable offer. P. O. Box 205, Elmwood, Connecticut.

JOHNSON

ROCKETS: 3 available from $3495. #9121SS has 100 hours. 190 HP. Lycoming. Aeromatic. Mufflers. Primary blind instruments. Radio. Loop. Licensed. $3800. Make offer. Apply, POWERS & GEORGE, Aircraft Brokers, 475 Fifth Avenue, New York City; or, 505 North Ervay, Dallas, Texas.

LUSCOMBE

LUSCOMBES: 45 available. 1947 metal wing, 65 HP., #2327KS, has 220 hours. Metal propeller. Extras. Clean. $1200. Also, 1947 all metal, 85 HP., #1958KS. with 160 hours. Complete electrical system. Radio. $1555. Inquire, POWERS & GEORGE, Aircraft Brokers, 475 Fifth Avenue, New York City; or, 505 North Ervay, Dallas, Texas.

NAVIONS

NAVIONS: 68 available from $4200. Late 1947 North American. #4148KS, is painted cream. 123 hours. Latest fuel system. Gyro. Narco omni-range. GE radio. All bulletins. Beautiful. $5500. Also, 1948 Ryan, #4420KS, with 115 hours. 205 HP. engine. Catalina tan. Standard equipment. November license. All bulletins. New condition. $6500. Apply, POWERS & GEORGE, Aircraft Brokers, 475 Fifth Avenue, New York City; or, 505 North Ervay, Dallas, Texas.

205 HP RYAN NAVION NC 4496 K. Perfect condition. Manufactured October 1948. Total time 400 hours. Completely equipped, including heater, special carpet, and full gyro instruments. Blue color. Will deliver anywhere in U. S. Make offer, no trades. B. O. Reynolds, Lake Geneva, Wisconsin.

NAVIONS: 17 available from $4,750. Late 1948, 85 total hours, ARC, ADF, VHF, Perfect. $9,000. 1949 model, 67 hours, VHF, ADF, etc. Clean. $10,250. 1947 model, 114 hours $6,700. Madden Aircraft Brokerage, 211 North Longview, Dayton 3, Ohio.

PIPER

CLIPPERS: 6 available. 1949, #5701HS, has 350 hours. Metal propeller. Sensitive altimeter. Stall warning. Two-way radio. Clean. $2375. Inquire, POWERS & GEORGE, Aircraft Brokers, 475 Fifth Avenue, New York City; or, 505 North Ervay, Dallas, Texas.

1949 PIPER CLIPPER, Radio, Lites, Fender, Spinner, Stall Warning Indicator. George Buck, Webster, Pa. Call Donora 43 J.

★ CLASSIFIED ADVERTISING ★

REPUBLIC

SEABEES: 44 available. Late 1947, #6789KS, Serial #971, has 290 hours. All latest modifications and improvements. All bulletins. Top condition. No corrosion. $2225. Apply, POWERS & GEORGE, Aircraft Brokers, 475 Fifth Avenue, New York City; or, 505 North Ervay, Dallas, Texas.

SEABEE: 23 available. Late 1946, 70 hours total. Steerable tailwheel. All bulletins up, better than new. Immaculate. $2,650. Madden Aircraft Brokerage, 211 North Longview, Dayton 3, Ohio.

STINSON

150'S & 165'S: 1947 Voyager 150, #8448KS, has 390 hours. Mufflers. Aeromatic. Gyros. Extra receiver. $2500. Also, 1948 standard Station Wagon, #6567MS, with 300 hours. Excellent. $3000. Also, 1948 Station Wagon, #6821MS, with 202 hours. Mufflers. Aeromatic. Spinner. Primary blind instruments. Loop. Stall Warning. All bulletins. New. $3500. Offers wanted. Inquire, POWERS & GEORGE, Aircraft Brokers, 475 Fifth Avenue, New York City; or, 505 North Ervay, Dallas, Texas.

STINSON 1948 VOYAGER—Like New. 51 Hours Total Time. Blind Flying Group. Hand Rubbed Maroon Finish. Always Hangared. Most Beautiful Stinson in Country. $4500.00. Licensed to December 1950. AiResearch Aviation Service Co., 5907 West Imperial Highway, Los Angeles 45, California. Phone: ORegon 8-2661.

STINSON: 65 voyagers and Station Wagons. 1947 Voyager, 67 hours, equipped, perfect. $2,500. Madden Aircraft Brokerage, 211 North Longview, Dayton 3, Ohio.

SWIFT

85'S: 4 available. #91367S has 167 hours. Beech propeller. Two-way radio. Extra instruments. October license. Best care. Excellent. $1125. Apply, POWERS & GEORGE, Aircraft Brokers, 475 Fifth Avenue, New York City; or, 505 North Ervay, Dallas, Texas.

125'S: 29 available from $1500. Globe, #3882KS, has 142 hours. Aeromatic. Two-way radio. Extra instruments. Landing light. Beautiful. All bulletins. $1800. Also, Temco 1948, #3952KS, with 196 hours. Aeromatic. Primary blind instruments. Radio. New condition. $2500. Inquire, POWERS & GEORGE, Aircraft Brokers, 475 Fifth Avenue, New York City; or, 505 North Ervay, Dallas, Texas.

MISCELLANEOUS

LIKE NEW 90 H.P. LUSCOMBE 1500.—Like New Stinson Gul-wing Reliant 245 Lyc-Hamilton Cont. Prop. $1500. Best Culver LCA in U.S. $750. Excellent Airmaster $1250—Like New Aeronca Chief $395. LICENSED GOOD CONDITION Stearman $650 J-5 Cruiser 85 H.P. $295—Cubs $350. Unlicensed but ferrable-Stearman $300-PT-19 $200.-BT-13A @ $200. Others at unequaled Sacrifice prices. We are never undersold. Pictures Available. Write or phone. Del Popwell Broker, Box 6284, Jacksonville, Florida.

FLYERS! Send today for the latest issue of "Wind-Socky." The Midwest's leading New and Used Aircraft Publication. Bargains! Pictures! And the latest Aviation News. Published monthly. Yearly subscription $2.00. 25¢ per copy. Box 683, Cedar Rapids, Iowa.

SEAPLANES: Cessna 140 on Edo 1620's. Floats less than 100 hours, fresh water only. All Cessna extras, 2 McCauley Propellers. $2,500. PA-12's on Edos from $2,100. Madden Aircraft Brokerage, 211 North Longview, Dayton 3, Ohio.

HOW TO BUY USED PLANES—Send 50¢—Aero-Information, Mr. Alex Berkes, Jr., Phillipsburg, N. J., R. D. #1.

AVIATION EQUIPMENT & SUPPLIES

FLYING SUITS, Wool gabardine, O. D. one zipper, small and medium $9.00. K1 tan cloth, 9 zippers, large regular only $10.00. B3A Flying Gloves, AAF, dark brown unlined genuine kidskin leather, all sizes $2.95 or natural Buckskin, size 8 & 9 only, $3.95. Rayon liners for B3A gloves 50¢ pair. White Nylon Scarfs, 66"x18", ladies or gents, $2.50. Safety Belts, $1.50. Gold Stamping; your name printed on leather strip, one line .65¢, two lines $1.00. Flying Equipment Company 1641-5 W. Wolfram St., Dept. S, Chicago 13, Ill.

GENUINE issue Navy Intermediate Flight Jackets, brand new, dark brown genuine goatskin leather, celanese lined, mouton fur collar, biswing back, zippered, elastic knit waistband and cuffs. $29.95 each. Orders of six or more, price $26.50 each. Sizes 34 to 46. Flying Equipment Co., 1641-5 W. Wolfram St., Dept. S, Chicago 13, Ill.

PILOT WINGS. U.S.A.F. design. Sterling silver. Mail orders filled promptly. SEND NO MONEY. Pay postman $2. plus postage, or SAVE by enclosing payment and we'll pay postage. Moneyback guarantee FREE catalogue. Federal Supply, 135-V Henry Street, New York 2, N. Y.

HELMETS. A-11, A.A.F, kidskin leather, sponge rubber earcups $3.45. ANH-15 AAF tan cloth, sponge rubber earcups $1.00. Send for free list other items. Flying Equipment Co., 1641-5 W. Wolfram St., Dept. S, Chicago 13, Ill.

E6B COMPUTER, like new, plastic $4.25 or metal $6.75 in leather holder. E6B Manual $2.50. Warner Computer-Plotter $3.00. Computer only $2.00, new. Flying Equipment Co., 1641-5 W. Wolfram St., Dept. S, Chicago 13, Ill.

BATTERIES & TIRES, brand new for all types aircraft. Bargains. Send for free list. Flying Equipment Co., 1641-5 W. Wolfram St., Dept. S, Chicago 13, Ill.

U.S.A.F., Civil Air Patrol, Flying Clubs, Private Pilots, send for FREE catalogue of insignia, uniforms. Federal Supply, 135-K Henry Street, New York 2, N. Y.

SAVE 50% ON NEW BINOCULARS! Free Catalog. Free Book, "How to Select Binoculars." Write Today! Bushnell Importers, 43-S52 East Green, Pasadena 1, California.

CHARLIE OBOE DOG EASY make sense? Handy decal for instrument panel shows radio code, phonetic alphabet, plane's number. Two for $1.00, includes Radio Calling Procedure and Language Digest. No C.O.D. Safetycals, 25 Woodridge, Muncie, Indiana.

NARCO-OMNI SYSTEM for quick sale. Write or wire Box 1, C/o Skyways, 444 Madison Ave., New York 22, N. Y.

TIRES for DC 3 and DC 4 and every size in the book. 5000 airplane wheels. Write for listing and catalog . . . Harmo Tire and Rubber Corp., 804 Hammond Building, Detroit 26, Michigan.

NEW STEARMAN PARTS. Get our list and compare prices before buying. Very large stock. D & S Industries. Box 1165, York, Pa.

WRITE for listing on new *tires, tubes,* and *wheels.* Dealers and Airports only. . . . Harmo Tire & Rubber Corp., 804 Hammond Building, Detroit 26, Michigan.

YOUR NAME AND WINGS in 23-Karat gold on leather patch. Military, or Civilian, $1.00 each. 3 for $2.00. Names only 2 for $1.00. Clubs, Schools, Airlines, your own wings or design. Julie's Leathercraft. Lone Tree, Ia.

LEATHER INSIGNIAS tooled and painted, five inch diameter $3.50. Discount on 12 or more. Send sketch or design. Satisfaction guaranteed. No C.O.D.'s. Julie's Leathercraft, Lone Tree, Iowa.

PARACHUTE SPECIAL—C.A.A. Approved. Seat type. 24 ft. $29.00; 28 ft. $39.00. 10% discount on two or more. For fresh packing add $3.50. Payment with order. Gaare Supply, Box 1377, Vernon, Texas.

BOOKS

AVIATION QUIZ BOOKS—The following outstanding books by Charles A. Zweng lead the field and prepare you for your rating. Included with each book are authentic examinations with new material not available elsewhere. Why take a chance? Zweng Books include: Flight Instructor $3.00; Flight Engineer $4.00; Link Instructor $4.00; Private & Commercial Rating $3.00; Instrument Ratings $4.00; Airline Transport Pilot Rating $4.00; Flight Navigator $3.00; Meteorology for Airmen $3.00; Aircraft & Engine Mechanic including hydraulics, weight and balance $3.00; Parachute Technician Rating $3.00; Flight Dispatcher $4.00; Civil Air Regulations $1.00; Private Pilot Rating $1.00; Airport Operation and Management $4.50; Zweng Aviation Dictionary $6.00. Aeronautical Navigation $3.00; Leading Airline Executive and Pilots owe their success to early training with Zweng Texts. Pan-American Navigation Service, 12021-22 Ventura Blvd., N. Hollywood, Calif. (Free Catalog.)

FLYING THE OMNIRANGE by Charles A. Zweng. (in preparation—estimated delivery date May 20th) A new "first edition" fully illustrated, designed to aid the pilot in flying the new Omnirange Stations now being established by the C.A.A. Orders accepted now on a C.O.D. basis or postpaid. DeLuxe edition only $4.00. Pan American Navigation Service, 12021-22 Ventura Blvd., N. Hollywood, Calif.

GUARANTEED: Ross Guaranteed Questionnaires are available for all C.A.A. ratings. They carry a full money back guarantee if you fail to pass your exams. Ross Questionnaires have been used by thousands of Pilots, Mechanics and Instructors with success. The frequent revisions insure your obtaining the very latest material. With a Ross Guaranteed Questionnaire you save time, Effort, and Money. Order direct or from your nearest Dealer. Engine Mechanic $3.00; Aircraft Mechanic $3.00; Both for $5.00; Commercial Pilot $4.00; Flight Instructor $4.00; Instrument Rating $4.00; Meteorology Instructor $2.50; Navigation Instructor $2.50; Aircraft Instructor $2.50; Engine Instructor $2.50; C.A.R. Instructor $2.50; Fundamentals of Instruction $1.00; As a special offer the complete set of the above Questionnaires are priced at only $15.00; Ross Guaranteed Questionnaires are the only books available that include the same Navigation and/or Weather maps that are used by C.A.A. on their exams. Free folder on request. Orders sent Postpaid or C.O.D. Ross Aero Publishers, Dept. 1-S, Administration Building, Commercial Airport, Tulsa, Oklahoma.

ELECTRONIC NAVIGATION, just published. For air or marine navigation. DeLuxe binding $4.50. Another new text entitled Flight Instructor Oral Examination by Zweng; a must book for the instructor and his student. Price $1.00. Control Tower Ratings are easier if you order Aircraft Dispatcher by Zweng $4.00. Pan American Navigation Service, 12021--22 Ventura Blvd., N. Hollywood, Calif.

WHY TAKE A CHANCE! Pass the Commercial Written the first time! You can test yourself with "Commercial Pilot Rating" before taking time-off to write the test. Navigation, including a free World Air Chart; Meteorology, including a station models and sequence reports; Aircraft and Engine maintenance and operation; and Civil Air regulations are fully covered. $2.00 cash or C.O.D. plus charges. Money back guarantee. Hangar Flying, Dept. 2D5, 112 E. Grove, Bloomington, Illinois. Clip this.

(Continued on page 62)

★ CLASSIFIED ADVERTISING ★

(Continued from page 61)

BOOKS, Continued

STUDENTS, MECHANICS, FLIGHT ENGINEERS: AMQ (Aero Mechanics' Questionnaire) by Ralph Rice is again available in a greatly enlarged and completely revised edition. 2300 multiple-choice questions with answers and explanatory notes covering all phases of Aircraft and Engine Mechanics including Power Plants, Carburetion, Lubrication, Propellers, Electricity, Woodwork, Dope and Fabric, Sheet Metal, Welding, Rigging, (including solved weight and balance problems), Hydraulics and Civil Air Regulations based on current issues. $3.98, postpaid, or C.O.D. plus postage. Address: Paxon Publications, Box 479, Lawrence, Kansas.

YOU NEED ONLY TO MAKE ONE TRIP to the Inspector's office to pass the Commercial Navigation Written if you study with "Simplified Navigation Workbook." All problems fully explained and illustrated. Complete with sample multiple choice questions to be solved from World Air Chart included free. Save time and money! Only $2.00 cash or C.O.D. plus charges. Money back guarantee. Hangar Flying, Dept. 2M5, 112 E. Grove, Bloomington, Illinois. Clip this.

WING TIPS FOR CROSS-COUNTRY FLYING. The new book, in non-technical language, explaining the little things that make cross-country navigation easy and safe, such as checking landmarks, weather, and special problems encountered in various parts of the country. Written by a pilot for pilots. $1.00 cash or C.O.D. plus charges. Money back guarantee. Hangar Flying, Dept. 2N5, 112 E. Grove, Bloomington, Illinois. Clip this.

BINOCULAR BOOK FREE! Tells you how to choose a Binocular to ensure lasting satisfaction for your particular purpose. Explains technical terms. Full of interesting and important information you will want to know before investing in Binoculars. Send for your copy TODAY! BUSHNELL IMPORTERS, 41-S53 E. Green, Pasadena, Cal.

WHAT EVERY PILOT SHOULD KNOW—Big book of "Questions for Pilots," including correct answers. Have fun in Hangar Flying sessions quizzing yourself and friends. 25¢ Cash, no stamp, no C.O.D. Hangar Flying, Dept. 2H5, 112 E. Grove, Bloomington, Illinois. Clip this.

FREE! How to fly cross-country safely, how to land at airports, told in free booklet, "Happy Landings," sent to Pilots and Students. Hangar Flying, Dept. 2J5, 112 E. Grove, Bloomington, Ill. Clip this.

MAGAZINES (back dated) foreign, domestic arts. Books, booklets, subscriptions, pin-ups, etc. Catalog 10¢ (refunded). Cicerone's Center, 86-22 Northern Blvd. Jackson Heights, New York.

BUSINESS OPPORTUNITIES

HOW TO START YOUR OWN BUSINESS IN AVIATION with little or no capital! New, 15,000 word handbook "Profitable Opportunities in Small Aviation Business" tells you how and where! Partial contents: 21 ways to make money with a light plane! 16 on-the-ground "shoestring" opportunities (capital $100 up)! 18 part-time ventures! 10 mail-order enterprises! Many new, little-known opportunities. $2.00 postpaid. Money back guarantee. For prompt reply—2 Free reports: "Guide to Successful Airport Operation" and "Alaskan Opportunities". Christopher Publications, Dept. DP-5, Holtsville, N. Y.

WOULD YOU PAY 3% first $350 made? Free booklet 505 Odd, Successful Enterprises Free. Work home. Expect something odd. PACIFIC, 6-Y, Oceanside, California.

EXPENSIVE HOBBIES REQUIRE EXTRA INCOME. Read "Dollars In The Mail." Have a bedroom office! Monogram House, Box 2212, Seattle 11, Wash.

HELP WANTED

FOREIGN EMPLOYMENT. Construction Men, Building Trades, Mechanics, Helpers, Office Men. Good workers interested in Foreign Development Projects. Pipe Lines, Dams, Power Plants, Roadways, Shipping, Oil Refineries, etc. Transportation and quarters furnished; High Wages. Listings of firms actively working on projects in Arabia, Persian Gulf, Africa, Alaska, Canada, South America, Europe, etc. Send $1.00 for Foreign Construction Compendium and Application forms. Foreign Service Bureau, Dept. SK5, (Employment) P. O. Box 295, Metuchen, N. J.

"142,000 AVIATION JOBS"—Official forecast! Now, for immediate opportunities, we will rush you: Confidential reports covering over 75 aviation job-openings (domestic, foreign) listed by employment agencies; manufacturers, airlines. Salaries! Qualifications! Where to apply! $1.25. Lists of companies to contact for high-paying jobs: 159 Airlines (including Alaskan, South American, Foreign, Non-scheduled): 82 Aircraft and accessory manufacturers. $1.25. 6,000-word Survey of Airline Employment, revealing many little-known opportunities for men, women, skilled, unskilled, $1.25. Limited time offer—all 3 for $2.00. Includes, Free! "Foreign Opportunities Report." Money back guarantee! Free advisory service! Christopher Publications, Dept. DG-5, Holtsville, New York.

GOOD PAYING JOBS NOW OPEN. Pilots, A. & E. Mechanics, Flight and Ground Personnel, Factory Workers, Construction, Etc. We'll rush confidential reports on who and where to contact for best opportunities at home and abroad. Includes best available Domestic, South American and Alaskan reports, and free one year registration and advisory service. Special foreign reports included on request. All for only $2.00 cash or C.O.D. Rush Air Mail letter for latest reports or Telegraph name and address and we'll send C.O.D. Only organization that gives 30 day guarantee of satisfaction or money back. We get results. 100% Veteran organization. (Note to Employers: Contact us to select from our large registration of skilled and unskilled personnel of all types. Many employers use this service to obtain all of their personnel. No charge.) RESEARCH SERVICES, Aviation Division, International Building, St. Louis 1, Missouri.

CROP DUSTING PAYS BIG MONEY. Confidential Report covering forty states tells you where to apply if you are an experienced pilot or want to learn this interesting and profitable profession. Only $2.00 cash or C.O.D. for "Report CD". Includes one year registration and advisory service. Satisfaction Guaranteed. RESEARCH SERVICES, Aviation Division, International Building, St. Louis 1, Missouri.

ALASKA—Last Great American Frontier. $1.00 brings 1950 Copyrighted Directory & Government Map Free. Big Construction Projects; Fishing; Mining; Aviation; Hunting-Fishing-Game rules; Fur-Farming; Lumber; Live Stock; Agriculture. Homestead Land & Highway information. Listing firms hiring. Application form. Alaska Opportunist, P. O. Box 883-SS, Hollywood 28, Calif.

INTERESTED IN LATIN AMERICAN & FOREIGN EMPLOYMENT? ? ? ? ? $1.00 brings 1950 Copyrighted "Foreign Service Directory" World Wide Listings in Construction; Oil, Mining, Aviation; Steamships; Manufacturers; Transportation; Exporters, Importers. Hot List Firms Hiring. How-When-Where to apply, Application form free. Global Reports, P. O. Box 883-SS, Hollywood 28, Calif.

PILOTS. We can help you find the right job. Send for application blank. No registration fee. PILOTS EMPLOYMENT AGENCY, Box 152S5, Whippany, N. J.

INSTRUCTION

BUILD, FLY—BULLET RACEPLANE. Fast, economical, low-winged lightplane. Blueprints $2.00. Corbcraft, 80 Maxwell, Rochester 11, N. Y.

YOU CAN DESIGN YOUR OWN DREAM AIRPLANE. New Simplified Home Study Course. Free Details. AIRPLANE DESIGN CORPORATION, DEPT. S, BOX 972 SEATTLE 11, WASHINGTON.

INSTRUMENTS

NAVIGATION INSTRUMENTS: Beautiful new and reconditioned precision instruments. Brand new Link Aircraft Sextants with case $37.50; Fairchild reconditioned $12.50; averaging type, $17.50; Bausch & Lomb Sextants, excellent condition, $49.75; Brunning Drafting Machines $55.00; Navy Stadimeters $24.00; Surveyors Levels $175.00; Seth Thomas Classroom elect. Clocks $14.35; 6-inch (new) Pioneer Magnetic Compass $12.95; Pioneer panel Compass (new) $17.50; Dalton Model "G" Computer (new) $7.50; Weems Mark II Plotter $2.00; Dalton E-6B Computer $10.00; A-2 Deluxe Computer with Case $3.00; American Airlines Computer $5.00; F-8 Aerial Cameras (new) $185.00; Astro Compasses (new) $12.50; (Free catalog) Pan-American Navigation Service, 12021-22 Ventura Blvd., N. Hollywood, Cal.

INSTRUMENTS — Kollsman Sensitive Altimeters $14.95; Pioneer Rate of Climbs $7.95; Turn and Banks $7.95; Cylinder Head Temperatures $7.95; Pioneer Compasses $5.95; 0-300 Airspeeds $5.95; Directional Gyros $29.95; Artificial Horizons $19.95; Manifold Pressures $5.95; Suction Gauges $2.95; Suction Regulating Valves $1.95; Ammeters $3.95; Voltmeters $3.95; B-7 Engine Unit $9.95; Headsets $1.45; Hand Microphones $1.45. Payment with order. Gaare Supply, Box 1377, Vernon, Texas.

MISCELLANEOUS

NEW YORKERS LEARN TO FLY. $4.00 per week. Train Grand Central to Golden Bridge. Best instructors. Somers Airport, Somers, N. Y. Free Pamphlet.

INFORMATION NEEDED? ? Pilots, Mechanics, Students, Aircraft Owners write for estimated fee to obtain any aviation information desired. Aviation Information Bureau, Box 234, Pacific Palisades, California.

1000 EMBOSSED BUSINESS CARDS, $4 postpaid. Cash with order. Superior Printing Co., 15745 Ardmore, Detroit 27, Mich.

POLICE JIU JITSU! Learn trick holds and knock-outs! Send for handbook containing complete illustrated course. $1.00. Christopher Publications, Dept. DJ-5, Holtsville, N. Y.

AERONAUTICAL REFERENCE DIRECTORY of Airlines, Aircraft & Accessories Manufacturers; Services, etc. 25¢ postpaid. D. E. Drum, Dept. S. Box 502, Stroudsburg, Pa.

ADULT JOKER NOVELTIES — Unusual sensational assortment $1.00 including lists. J. Tupler, 216 W. Jackson, Chicago, Illinois.

SKYWAYS

Classified Advertising

Rates

8¢ per word - first 15 words

(minimum size) - $1.00

Classified forms close first of

second month preceding date of issue

Angle of Attack

(*Continued from page 35*)

an aid to automatic landings in 1928. Tests were made with all kinds of pilots, both beginners and experienced airmen. These tests proved that accurate judging of angle of attack could *not* be consistently done. Pilots were accurate in judgment of angles up to 7°. After this point, for a reason never determined, a pilot just can't seem to tell what his angle of attack is.

During the war, Commander Saxman worked with the Navy's Special Devices Center in order to develop an all-weather, automatic system of flying. Special Devices reports that the system is quite successful. Many flight tests have been completed and are continuing under all sorts of conditions. The Special Devices Center is piling up the know-how and the data to bring all-weather, instrument landing to both military and civilian flying.

At present the indicator must have an extremely rigid mounting on the plane. There is a boom on which the device is mounted, extending about six feet forward of the nose, with the two vanes attached. A less easily damaged, less bulky adaptation would be the differential pressure-sensing device which is being developed commercially. Experiments are being made with a plate mounted in the wing to tell the amount of pressure on the top of the wing and the amount of pressure on the bottom. The ratio here would be calibrated on a dial in the pilot's compartment to show the angle of attack.

When these meters become available, we may find that they are the answer to our stall-prevention flight-instruction problems. A pilot's inability to reliably and accurately judge his angle of attack is normally compensated for by using the airspeed indicator. The varying stalling speeds, due to changing conditions such as tight turns, sudden pull-ups, or extra weight, cause many a pilot to misjudge the proximity of a stall. As a result, in 1948, there were 1,184 stall accidents. These were accidents caused by stalling *unexpectedly*.

Don't pilots know when they're stalling? Industry and government officials are pulling their hair over this question. Publication of statistics, education, safer airplanes, etc., are all making progress yet the problem must be faced.

When you really think of it, it isn't difficult to understand the pilots' difficulty. Remember those lessons you received while learning to fly? Didn't they go something like this?

"Now never let that airspeed get below 50 mph or the plane will stall."

"Don't forget that with a 30° bank the ship will stall at 54 mph."

"Remember that with a 50° bank the ship stalls at 62 mph. A 70° bank will cause a stall at 85 mph." Confusing isn't it.

Then a conscientious instructor will fully explain that "the airplane also changes stalling speed according to the load it carries." When you ask him, "How much?" or "What speed with what load" it would take an engineer to answer you so he merely reminds you to keep plenty of speed under all conditions.

Another classic instruction is, "Don't jerk your airplane around; you may stall it." How much of a pull creates what stalling speed again becomes complex.

"Don't pull up suddenly on take-off or landing—you'll stall." When you wonder how much or how to anticipate it, the answer is simple. "You must gain experience. You must learn to 'feel' the plane out." If you don't learn, you are led to believe you will be just another statistic under the Stall-Accident column.

Why accept this method of flying? An airplane, which is a logical, mechanical machine, is not this temperamental. Stall-warning indicators are a big step forward. The angle-of-attack indicator may be a greater one for training pilots easily in *when* to expect a stall.

In flight instruction, imagine getting just one piece of advice in reference to stalls instead of the present confusing array of instructions! Your instructor then would simply say, "Buddy, this ship stalls at 17° angle of attack." With the help of only an occasional glance at this gadget, the student would soon discover almost without help when a turn or pull up was becoming dangerous. It will not replace the old school of "feeling" your airplane out, but it would train pilots to recognize the variety of situations in which a stall could develop.

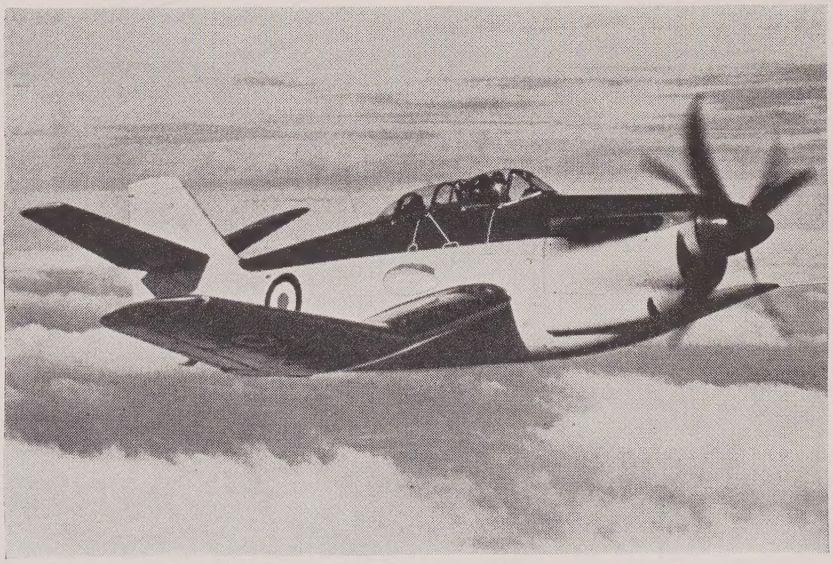
The most experienced pilots try to out-fly the performance of their airplane because they simply do not have a hard and fast rule to apply and so think they can get away with it. Under the clear, cool eye of the indicator, they would be less apt to attempt the aerodynamically impossible. Once a pilot sees on a dial, demonstrated with a variety of situations, that flight beyond a certain number of degrees of angle of attack is impossible, he would not attempt so readily to defy the laws of aero engineering.

Instead of allowing the liberal margins of airspeed which are now a necessity for safe flight, the pilot would be able to fly his plane more efficiently. Each airplane has one angle of attack which is best and most economical for cruising. This angle, if it were possible to accurately judge it, would result in a great saving in fuel and general economy. In getting in and out of short fields, it would improve the safety of the operation by warning the pilot when a gust or pull up is approaching a critical angle. The pilot will then be able to recognize his hazardous habits rather than letting them slowly develop during his flying career. Have you ever pulled up over a line of trees and wondered in the back of your mind just how close to stalling you were? The peace of mind that would have resulted from your having an indicator there to reassure you would have been worth quite a bit.

Both old pilots and beginners may well find the angle-of-attack indicator encourages them to fly more smoothly, since with each "jerk" the needle wags an admonitory finger.

It looks like there is a bright future ahead for us now. With the development by the Navy's Special Devices Center of a safety training device like this angle-of-attack indicator, we can look ahead hopefully. Our flying future will become even more enjoyable than it is now. With the advent of this angle-of-attack indicator as well as the stall warning indicator, it may be that the 49 per cent of all fatal non-aircarrier accidents due to stalls-spins will one day be a startling figure to look back upon.

It is encouraging to note that so many of the military groups, as in the case of Special Devices Center, are not only engaged in matters that will benefit national security but will also aid civilian flying safety.



Anti-Sub Striker

Rivaling the Fairey 17 in a bid for a Royal Navy production contract is this new Blackburn Y.A. 5. The Y.A. 5 is a carrier-based submarine bomber that presently is powered by 2,450-hp Rolls-Royce *Griffon* engine. Later models of the Y.A. 5 probably will have the turbo-prop *Mamba* unit of 2,580 horsepower. The jet efflux which would normally be used if and when it is jet powered, can be seen above the wing root. According to reliable sources, the Y.A. 5 employs power assisted controls which give the shipboard plane a high degree of maneuverability. No other information is available regarding this experimental Royal Navy anti-sub ship.

Dilbert

(*Continued from page 36*)

flight time with no taxi accidents.

Following are some of the rudiments to help you qualify for these degrees:

1. Taxi at a safe rate of speed to permit sufficient S-turning and positive control at all times. The more confined the area, the slower the taxi speed.

2. Never taxi into an area that has not been cleared visually. Maneuver in such a way that built-in blind spots never blank out an area into which the plane is taxiing.

3. Never allow your attention to be concentrated solely in one direction.

4. Never taxi too closely behind another plane. Taxi so that a stop can be made without collision or nosing-up should the plane ahead halt suddenly.

5. Establish and maintain radio contact with the tower for all operations on or near the field. The tower can be of great assistance in this matter.

6. Do not depend on vehicular traffic to give you the right-of-way. Drivers are often ignorant of your visibility and maneuvering limitations.

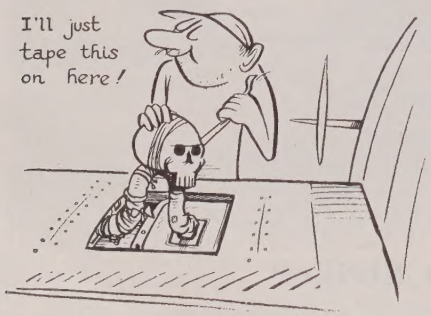
7. If your plane stalls on the field, take immediate precautionary action. Notify the tower, then get out of your plane and wave off other aircraft.

8. Be especially careful at night. Visibility is reduced, so taxi slower and keep a sharp look-out. Be sure running lights are functioning.

9. Use brakes intelligently. Many nose-ups are caused by unnecessarily abrupt application of brakes.

Grim Maintenance—Suppose you were hired to ferry an old plane cross-country. Shortly after take-off, fire breaks out in the engine compartment. Right away you are on the spot—you're too low to jump and the terrain ahead is very rocky. How do you solve that one?

Here's what one gutty expert did. He immediately sized up the situation and turned back to the field, violently skidding his turns, to keep the smoke and flames away from the cockpit as much as possible. Then he sideslipped all the way down to a landing and jumped out only slightly singed.



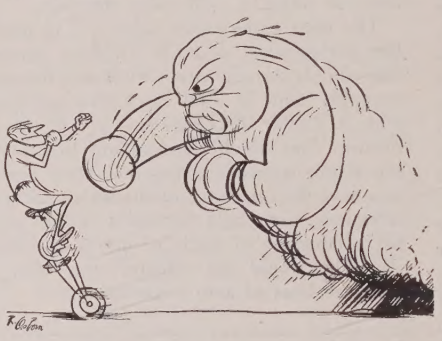
The fire was quickly brought under control. It didn't take long to locate the cause; a section of rubber gas hose had two cuts in it which allowed fuel to escape. Believe it or not, instead of replacing this short section of hose, a mechanic had attempted to repair it by covering the slits with friction tape. How would you have reacted to that situation?

Well, that's just what this pilot did—he took a lusty swing at the mech. Even when they were pulled apart, the pilot kept giving him a verbal beating. ". . . too damn lazy . . . unqualified . . . incompetent . . . unreliable!"

I'll admit my sympathy is all with the aggrieved pilot in this case. Any way you look at it, ignorance or laziness, this was pretty grim maintenance. It's a lousy trick to certify such a plane as "ready for flight" and expect somebody else to fly it. A thing like that is practically arson—and might very easily become homicide.

Types of Weather to Avoid—*Low Pressure Areas*—They are a warning that nasty weather may be developing and that you should be alert for unfavorable changes. Examine the present weather carefully in the low-pressure area and note especially the rate of pressure change.

High Winds—If you are flying a lightplane, give special attention to the wind velocity. High head winds mean slow ground speeds, with the necessity of frequent refueling. Gusts and high wind velocity make landings hazardous and control of the plane on the ground difficult.



Thunderstorms—Thunderstorms are of either the frontal or air-mass type. Some are local and relatively stationary, while others develop with the moving air mass. Knowledge of the type of thunderstorm is necessary to efficient flight planning. Avoid local thunderstorms; they too, can be severe.

Precipitation—Fog or rain may be expected when the temperature and dew point approximate each other. Compare the hourly sequence reports to obtain the trend of temperature and dew point. Always allow some margin in your planning for accelerations in the weather trends.

Showers and Squalls—Showers are associated with warm fronts, and squalls with cold fronts. Skirt around to avoid them, or remain on the ground until they have passed.

Orchids (little ones) to Dilbert—Dilbert flew through some small trees when his engine momentarily cut out immediately after take-off, but he was able to stay in the air. He climbed to 1,000 feet and tested the stall characteristics of his plane to see if it was safe to land. It was, and he did.

I'm certainly glad to see these budding signs of sense in Dilbert. He did a nice job of flying when he went through those branches, and he was absolutely right in testing his ship before coming in to land. But . . . 1,000 feet was far from a safe altitude to make this test; 5,000 feet is the minimum. What if his plane had been so damaged that it whipped out of control near normal stalling speed? After wrestling it through a couple turns, it might have been too late to jump.

Guess it's a mistake to expect too much from Dilbert, but this 1,000-foot blooper raises another question. Was he just lucky or did he know enough to plan his approach so as to stay well within the limits of speed and altitude which his tests had shown to be safe? Again, I suspect he was lucky.

Safety Quiz Answers (page 36)

1. Open—to prevent heat damage to electrical insulation.
2. Instruments, like any other material, are subject to failure. When one goes out you must be able to maintain control through a combination of others.
3. To the left—and long enough to observe other traffic.

PICTURE CREDITS

Page 8: Pratt & Whitney, Lockheed; 10: Aeronca, Sanders; 14, 15: Lockheed; 16, 17: Texas Dept. Public Safety; 18, 19, 20: Don Downie; 21: Wm. Green; 22, 23: Wide World, International News Photos, Acme, Col. Morden; 24, 25: Ed Hoadley; 26, 27: Official Air Force 1600th Air Transport Wing, Westover; 28, 29: Ryan; 30, 31: H. J. Burrows; 32, 33: Nat'l Military Establishment, U.S. Army; 34, 35: CAA, U.S. Navy, Cessna, Luscombe; 38, 39: Don Downie, Courtesy "Aircraft Powerplants," Northrop Aero Inst.; 40: Grand Central Airport Corp., Consolidated-Vultee; 41: Lockheed; 42: Civil Air Patrol; 43: Lockheed; 44: Downie; 46: Levy; 48: Fairchild; 50: Fairchild; 51: Nat'l Military Establishment; 52: Consolidated-Vultee; 54: Official Marine Corps; 56: Ryan; 58: North American; 63: John S. Webb.

PRINTED IN THE U. S. A. BY THE CUNEO PRESS, INC.